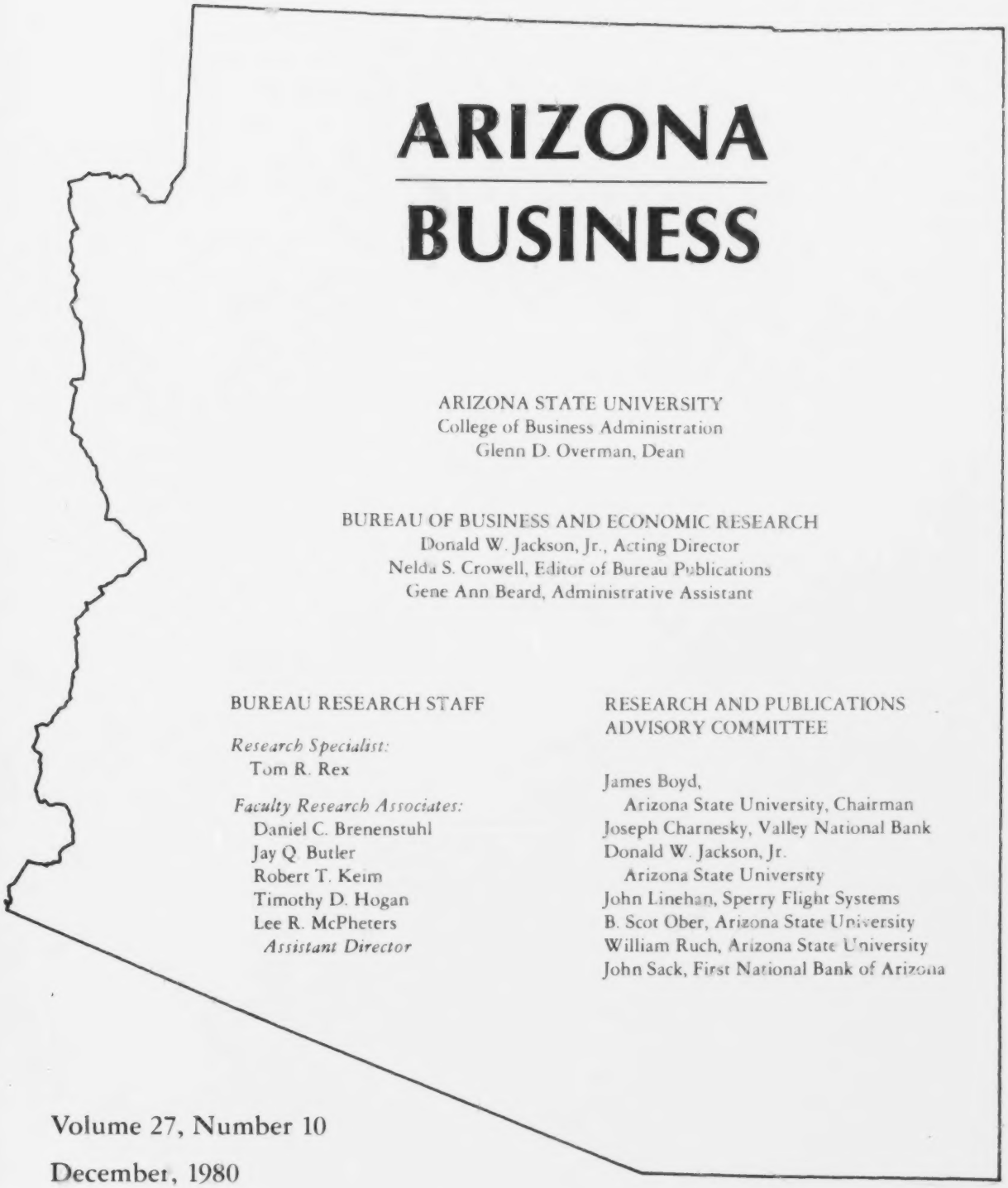

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Report to The Reader

Each December, several College of Business Administration faculty members from Arizona State University and representatives from the business community forecast national, state, and local economic activity.

The analyses are presented at the Economic Forecast Luncheon, held this year on December 11. Over 1,350 people attended the event, which is in its nineteenth year. As in years past, the December issue of *Arizona Business* features the presentations of the speakers.

According to Dr. John Cochran, ASU Professor of Economics, "Most of the economic policies of the new administration will be geared toward long run goals of reducing inflation and increasing economic growth; therefore it would be unrealistic to expect immediate effects in 1981." He adds, however, that "particular tax cuts or sharp cuts in existing government programs will have considerable impact on the 1982 budget."

Dr. Richard Winkelman, Associate Professor of Economics, reports that "total real personal income in Arizona can be expected to rise, but as a result of inflation, real per capita income will fall for the third straight year." However, he says, "the rate of decline will be much less than in 1980."

The panel of community representatives reported similar forecasts. B. Paul Jones, of the Valley National Bank, said, "The scheduled increases in social security taxes and personal income taxes through 'bracket creep' will further impair family spendable incomes....More of family incomes will have to be dedicated to necessities."

Jackie Pettycrew of Phoenix Newspapers Inc. reported that residential housing can be expected to shift back toward single-family dwellings. John R. Welty of Motorola indicated that the outlook for manufacturing is good with moderate increases expected by nearly all companies surveyed.

This year for the first time, those attending the luncheon received a booklet entitled *1981 Arizona Economic Outlook*, which was prepared by the ASU Forecasting Group. The booklet shows the following forecasts for six key economic indicators:

- *Personal Income:* Up 13 percent to $26 billion
- *Employment:* Up 3 percent to 1.02 million
- *Population:* Up 2.2 percent to 2.8 million
- *Consumer Price Index:* Up 12 percent
- *Retail Sales:* Up 12.7 percent to $15.5 billion
- *Construction:* Up 12 percent to 92,000 permits

National Economic Outlook for 1981: A Year in Transition

JOHN A. COCHRAN

It has now been more than a month since Ronald Reagan became President-elect in a national election that produced a Republican majority in the Senate and a greatly reduced Democratic majority in the House. The new conservative tide will undoubtedly result in new economic policies at the federal level with subsequent impact on the overall economy. However, most of these new economic policies will be geared toward long run goals of reducing inflation and increasing economic growth; therefore, it would be unrealistic to expect an immediate dramatic effect on the economy in 1981. Budget goals for this fiscal year, which began on October 1, were determined well before the election and were finally validated by the lame duck Congress after the election. The new President is not inaugurated until January 20, 1981, and it will be difficult for him to have much impact on the present fiscal year, which runs through September, 1981.

The national economic outlook for 1981 has already been basically shaped by the economic forces of 1980. Little or no growth is expected in the first half of 1981, but a real economic upswing can be expected about midyear with a strong economic advance in 1982. This report was one of the presentations at the annual ASU Economic Forecast Luncheon on December 11.

John A. Cochran is Professor of Economics in the College of Business Administration, Arizona State University.

Policy in fiscal year 1982, however, will undoubtedly be shaped by the new administration, even though budgetary planning is already well advanced for that year. Particular tax cuts, for example, or sharp cuts in existing government programs will undoubtedly have considerable impact on the 1982 budget. Even here, however, months of debate in Congress, possibly involving some political compromises, are likely before the new 1982 budget is determined. In short, the economic outlook for 1981 will be largely determined by economic forces already at work in 1980. Subsequent years, of course, are quite a different matter.

At present, we have a very strong economy that is being hobbled by high inflation and high interest rates. For 1981, therefore, Americans can expect a continuation of the slow economic growth of late 1980. Real gross national product (GNP) next year should rise only about 1 percent. The national inflation rate should fall somewhat from the more than 13 percent rate at the retail level in 1980 to about 10 percent for 1981. Growth in labor productivity, which was negative in 1979 and the first half of 1980, should show a modest positive growth, which began in the third quarter of 1980. During 1980, interest rates rose sharply, fell sharply, and then rose again; they should fall somewhat in the first half of 1981 but then may be back up again in the second half of 1981. If the rate of inflation falls slightly in 1981, as expected, then the average level of interest rates next year should be somewhat lower than that of 1980.

The nation's unemployment rate should increase in 1981, since the expected modest growth in real output

will not be enough to provide new jobs for all the new job seekers next year.The labor force should increase about 1.6 million in 1981. American exports, particularly agricultural exports, should continue to show gains next year. Nevertheless, recessions or slow economic growth in many other industrial nations will make export growth next year somewhat harder than this year.

THE PAST YEAR

The year 1980 brought the recession that economists had been expecting, but in many ways it was a strange and atypical recession. Economic growth was very slow in the first quarter of 1980 and declined very sharply in the second quarter — the sharpest decline in real terms (9.6 percent) since World War II. A mild recovery of 1 percent in real terms occurred in the third quarter, marked by a rebound in interest rates, which in turn slowed consumer spending on new houses and new cars. The fourth quarter continued to show a mild upturn in economic activity. The typical postwar recession has been marked by a V-shaped decline and recovery, and above all, by a decline in real output for two quarters or more. But almost nothing about this recession has been typical, except that housing and automobile sales have both been adversely affected.

One of the strangest things about the past year was the gyration in the money and capital markets. Interest rates now are nearly as high as they were last spring, but this similarity masks an enormous roller-coaster ride in the financial markets in 1979 to 1980.

It all began with the Saturday Night Special of October 6, 1979, when the Federal Reserve announced that henceforth it would put its greatest emphasis on controlling the rate of growth in monetary aggregates and would allow interest rates to be determined largely by market forces. A similar statement was made several times before in the 1970s, but this time the Federal Reserve really seemed to mean it.

The escalating inflation rates of late 1979 exploded into 18 percent annualized rates of increase in the Consumer Price Index in the first quarter of 1980. Market interest rates responded by escalating too, since lenders want a positive real rate of interest. To get this, the nominal or market rate of interest must be higher than the actual and expected rate of inflation. The prime rate — from which all other bank interest rates are scaled upwards — hit 20 percent in early April before falling sharply to 10¾ percent in June, after which it rose again to 20 percent by December 10. All other market interest rates experienced a similar oscillation. Such sharp fluctuations in the cost of borrowing make it difficult for would-be borrowers, or lenders, to plan for the future, however.

By late December, money market yields are expected to have peaked and some declines may even be noted with further declines expected in early 1981. The major economic reason for this expected peaking in interest rates seems to be that, although the economy did rebound somewhat in the third and fourth quarters, further recovery seems likely to be slow and less vigorous than most post-war upswings after economic recessions.

One reason is that a number of European countries seem about ready to go into the recession from which the United States is slowly recovering. A slowdown in foreign economic growth portends a slower rate of growth of United States exports, which in turn would not help to spark our economic recovery. Britain, Germany, the Netherlands, and France — the big four United States customers in Europe — are all experiencing weaker economic activity in late 1980 which is expected to continue into early 1981.

Interest rate increases, of course, are caused not only by an upturn in economic activity but also by inflationary expectations. Because of this, it is somewhat sobering to realize that a number of large corporate borrowers recently have been willing to pay 20 percent interest or more for short-term funds. This suggests that they are concerned about the prospects of further inflation. Many consumers, on the other hand, are not able to pay the current high interest rates and have been squeezed out of the housing market and the market for big ticket durable goods, such as automobiles.

THE CONSUMER IN 1981

The American consumer was causing concern among economic analysts in late 1980. In the first place, the economic upswing of April, 1975, to early 1980, was marked by strong consumer spending, which was financed in part by rising consumer debt. Such spending was particularly strong for various consumer durables, including foreign and domestic automobiles, and items needed to furnish new houses. Such durables are typically financed by consumer borrowing and the last economic upturn was no exception.

All of this came to an abrupt end after March 14, 1980, when the Federal Reserve announced stringent restrictions on new consumer borrowing. Apparently some consumers thought they could not borrow at all; at any rate they had already accumulated a very large amount of

debt, so they repaid outstanding debts at a record rate of $9 billion in the second quarter of 1980, which meant that consumer spending in the same period fell sharply. The improved liquidity of households and the sharp decline in interest rates after early April did lead the consumer back to the markeplace, particularly the housing market. Nevertheless, a rebound of interest rates, continued inflation, and uncertainty about the future prospects for the economy led to only modest increases in consumer spending in the fall of 1980.

The key factor of concern among economists in analyzing future consumer spending trends is the direct and indirect effect of high inflation. Despite the sharp decline in consumer spending and the sharp decline in real output in the second quarter of 1980, little relief in inflation was noted. The basic rate of inflation, in fact, now seems to be in the 9 to 10 percent range. This means that firms are likely to take any opportunity of increased sales to widen profit spreads, which have often been squeezed by inflation. Even in the face of weak sales, automobile manufacturers in the fall of 1980 typically increased their list prices; this was true for both domestic autos and foreign imports. Restaurant prices are increasing, as is the price of food at the wholesale and retail level. Energy prices seem determined to continue to climb, despite any temporary leveling off. Airline and other transportation costs are still rising.

In the face of continuing inflation at both the retail and the producer level, dollar wage and salary payments have risen at a slower rate so that real income available for consumer spending has actually declined throughout 1980. In dollar terms, consumer spending has risen for six months in a row, although in some months, price increases have led to a lower volume of unit sales. Consumer spending was partly financed by a decline in the savings rate out of disposable personal income. For example, it fell from 5 percent in June to 4.6 percent in August. Both of these rates, incidentally, are well below long-run "normal" savings rates averaging around 7 percent. Despite large debt repayments in the second quarter, the consumer is still carrying a large debt burden from the splurge of consumer spending from April, 1975, to early 1980.

It seems unlikely that the earlier sharp rises in consumer spending will be repeated in early 1981. By mid-1981, however, some economic uncertainities may have been removed, the inflation rate may be somewhat lower than in 1980, and any improvements in real income, e.g., by actual or prospective tax cuts, might be translated rather quickly into higher rates of consumer spending. Spending on big ticket items, like automobiles and new housing, would be further stimulated if interest rates were lower.

HOUSING STARTS

Spending on new housing is the most important expenditure decision made by the household. Since most of the new housing cost is financed by a mortgage, the interest rate on that mortgage affects the size of monthly payments and thus the ability of the household to make a new housing purchase. The sensitivity of new housing starts to interest rates has led to dramatic fluctuations in residential construction in recent decades whenever interest rates rise of fall sharply.

In the second half of the 1960s, when our present inflationary period began, housing starts in the United States never got higher than 1.5 million per year; but in the early 1970s — most notably in 1971, 1972, and 1973 — housing starts ran at 2 million or more a year. In 1974 and 1975, however, which was a period of severe credit restraint by the Federal Reserve and correspondingly sharply rising interest rates, housing starts fell to 1.3 million and then to 1.1 million. Recovery in residential construction due to falling interest rates resulted in 1.5 million housing starts in 1976, 1.9 million starts in 1977, and 2 million units again in 1978.

Lower interest rates were not the only reason for rising housing starts, of course. Other factors included an increase in the rate of new family formation due to many people of the postwar baby boom coming of age, an increase in families with two wage earners, as more and more women moved into the work force, and, finally, an increase in inflationary expectations in the late 1970s. In many respects, the latter proved to be a self-fulfilling prophecy since the higher demand for homes led to higher prices.

In 1979 and 1980, however, the trend in housing starts was downward. Some 1.7 million houses were started in 1979, which was clearly down from the 2 million level of 1978. Once again, rising interest rates seemed to be the main culprit. Interest rates continued to soar in the first quarter of 1980, and further choked off residential building, and in the second quarter a sharp plunge of 9.6 percent in real GNP led to a corresponding decline in the demand for new housing. Housing starts, which began in 1980 at a seasonally adjusted annual rate of 1.4 million in January, plunged to a low of 906,000 units in May.

Interest rates peaked in early April and then fell for several months thereafter, sparking renewed interest in housing expenditures. But housing starts, which bounced up to an annual rate of 1.4 million in the third quarter,

were sagging somewhat in the fourth quarter and were likely to be about 1 million or less in that quarter. Interest rates for new mortgages, which had fallen to about 11½ percent in the summer, were over 15 percent by late fall, and new housing sales fell in each of three months as a result.

Some recovery in housing starts is generally expected for 1981 since interest rates are expected to decline somewhat. Furthermore, demographic factors still favor rising housing starts. Nevertheless, the expected level of 1.5 to 1.6 million new housing starts in 1981 still seems somewhat anemic compared to the robust level of 2 million new starts a decade earlier. The expected slow revival of residential construction fits in with the overall picture of a slowly reviving economy in 1981.

CAPITAL SPENDING IN 1981

New residential construction is included in the Department of Commerce data on Gross Private Domestic Investment and the woes affecting the housing market, particularly due to high and rising interest rates have already been noted. In turning to business expenditures on new plants and equipment, and the accumulation of inventories (which are the other parts of Gross Private Domestic Investment) economic woes can be noted here, too. High and rising interest rates affect not only consumers intending to make large durable purchases, like automobiles and new houses, but also businesses wishing to make capital purchases.

Internal funds — either retained earnings or depreciation allowances — help provide the bulk of the funds needed for new capital purchases, but a significant part of the funds must be secured externally, especially in the form of new borrowings from banks or in the capital markets. For much of 1980, the capital markets have been a difficult source of funds. In the first quarter of 1980, these markets almost dried up. Many bond flotations deferred in the first quarter did come to market in the second quarter and helped restore reduced corporate liquidity, pay off bank loans and finance new or ongoing capital projects. In the third and fourth quarters, however, more projected bond flotations were deferred again. One of the fundamental problems in borrowing in financial markets is the gigantic appetite of the federal government for borrowed funds owing to annual deficits as high as $60 billion year after year. The federal government will get what it needs, even if it has to crowd out private borrowers by sharply increasing interest rates.

Secondly, in looking forward to early 1981, many business firms may be worried about excess capacity brought about by sluggish consumer spending and some excess inventories, rather than being concerned about tight production schedules and a long lag in getting orders filled from suppliers, which typically spur increased capital spending. Furthermore, high inflation rates make it difficult to do the kind of rational projections of costs and returns necessary to make large expenditures for increasing production capacity. Much uncertainty still exists in the economy, which does not encourage large increases in capital spending. Nevertheless, real capital spending this year should match that of last year. The second half of 1980 will record a 3.5 percent decline in real capital spending, while the first half of 1981 should show a 2.5 percent increase. These data come from a survey just released by the Department of Commerce. Furthermore, if the inflation rate falls in the first half of 1981, if consumer spending revives, and if the expected large cut on business taxes and improved depreciation allowances occurs, then capital spending should revive strongly in late 1981 and 1982. Although capital spending in current dollars should show increases over 1980, a small decline in real, or inflation-adjusted, dollars may occur.

FISCAL POLICY IN 1981

As previously noted, part of the reason interest rates have risen to such high levels again late in 1980 is the continuing large appetite of the federal government for borrowed funds because of chronically large budget deficits. It is true that the budget for fiscal year 1981 contains a smaller deficit than that actually experienced in fiscal year 1980; the deficit in 1980 was around $59 billion and that contemplated in the new budget is only $27.4 billion. However, forecast budget deficits often turn out to be smaller than the actual deficit recorded for the year and 1981 will probably be no exception.

Taxes will certainly go up January 1, 1981, as both the tax rate and the income base for Social Security taxes go up sharply. However, both personal income taxes and business taxes are probably going to be cut by the new Congress next year, Furthermore, defense spending in the new fiscal year was authorized at $161 billion by Congress, which compared with only $117.7 billion as recently as fiscal year 1979, while President-elect Reagan promises still larger amounts of defense spending. Simultaneous tax cuts along with increased military spending, unless fully offset by cuts in government nondefense spending, promise to increase the budget deficit, if not in fiscal year 1981 then almost certainly in fiscal year 1982. Any increased budget deficit would renew pressures on the money and capital markets and

could lead to higher interest rates again late in 1981 after a decline in such rates early in 1981.

THE REAGAN ECONOMIC STRATEGY

In the nearly half a century since Franklin D. Roosevelt was elected in November, 1932, and inaugurated on March 4, 1933, the clear trend in the United States has been toward a much larger role of the federal government. As a consequence, the relative role of the state and local governments has diminished and the economic system has had to bear an increasing tax burden, as well as numerous and sometimes conflicting federal regulations. President-elect Reagan has promised that he will reverse this trend. A new federalism will be installed, whereby many of the functions, responsibilities, and even tax sources, will be relinquished by the federal government to the states and localities. This would mean a cut in government spending.

The philosophy of the new President also includes the desirability — and even necessity — of cutting both personal and business taxes. President-elect Reagan has embraced the Kemp-Roth tax proposal, which calls for a 30 percent cut in tax rates over a three-year period, which will hopefully increase incentives to work and produce, as well as provide more savings.

On the other hand, special tax incentives should be provided for business firms in order to increase real investment. Real investment is an increase in the stock of capital goods and leads to a subsequent increase in the production of goods and services. If real investment is increased, the rate of economic growth will rise, which means that there will be more jobs as well as increased real output. An increase in real investment should also result in more worker productivity, which will help to reduce inflationary pressures. From one point of view, inflation can simply be regarded as a much higher growth in money wages than in worker productivity; but from another point of view, it can be viewed as resulting from large — and often growing — budget deficits and too large an increase in the money supply by the Federal Reserve.

The economic strategy of the new administration is to develop new long-term economic goals, which will be fundamentally different from the last fifty years. Basic reliance is to be placed on the productive abilities of the market system with the individual determinations within that market discipline. It is not clear whether four years will be long enough to reverse the previous economic and political trends. Not only are there now well-established interest groups, who clearly benefit from various government programs (as well as other groups who regard themselves as being harmed by such programs), but also the United States is much more involved with the rest of the world than it was half a century ago. The accelerating, and sometimes double-digit, inflation of the last fifteen years was originally a result of increasing escalation of the Vietnam War as well as increased welfare programs at home from the Great Society approach of Lyndon Johnson.

After the United States left Vietnam in 1973, the OPEC nations began the series of oil price increases which still have not stopped, and provide inflationary pressures from abroad in addition to domestic inflationary pressures. Besides the United States, many other countries have experienced double-digit inflation in recent years, which is partly exported to countries heavily involved in foreign trade. Some, like Great Britain, have rates that are often double the annual rates of inflation in the United States, while other countries have even experienced triple-digit inflation, i.e., inflation rates of 100 percent or more each year.

Added to the difficulties of reducing inflationary pressures, President-elect Reagan proposes sharp increases in military expenditures. However, increased military expenditures, along with the sharp cuts in income taxes, will surely increase the budget deficit unless sharp cuts in government expenditures for nonmilitary purposes, particularly in transfer payments to individuals and state and local governments, can be achieved at the same time. In the long run, such an economic strategy will likely increase economic growth and productivity but in the short run it could lead to more inflation.

CONCLUSION

As indicated at the beginning of this article, the landslide victory on November 4 of Ronald Reagan will not significantly affect the economic outlook for 1981, which has already been basically determined by economic forces at work in 1980. In general, little or no growth is expected in the first half of 1981, followed by a real economic upswing about midyear. This could translate into a strong economic advance in 1982. Beyond 1982 and at least until early 1985 will be Reagan years, and the economic outlook in those years will be greatly influenced by the economic policies of the new administration — not only the economic philosophy of the new administration but also the timing of the new policies.

The new administration is expected to be much more consistent and persistent in its policies than the outgoing administration. A favorable business climate of opinion in Washington is expected and it is hoped that the new administration will succeed in its announced new goals.

The Arizona Economic Scene: Expectations for 1981

RICHARD D. WINKELMAN

On the surface, 1980 was a good year for the Arizona economy, but much of the gain was illusory and was offset by rampant inflation. For the second straight year, there was a decline in real per capita income. Much of this will be reversed in 1981. Inflation will continue to hurt us, but hopefully, not quite as badly as it did in 1980.

The 1981 forecast for Arizona is in two parts. The first part stresses the values for key indicators and their rates of change, recorded in Tables 1 and 2. These key indicators, are total and per capita income expressed in both current and constant dollars, population, rate of unemployment, the Metropolitan Phoenix Consumer Price Index, and the volume of retail sales in both current and constant dollars.

The second part discusses several broad sectors of the Arizona economy and the role they will play in determining the value of the key indicators. For analytical convenience the sectors are divided into two groups. The first group is referred to as *basic* since much of the output of these basic sectors is sold outside Arizona. Given the small local market, it is obvious that Arizona's prosperity rests on the ability of these basic sectors to sell their output outside of Arizona. These basic sectors include mining, manufacturing, agriculture, and tourism. Not all of the output of these sectors is sold outside of Arizona, but the largest proportion is.

The second group is the *induced* sectors, a term which implies that they depend on the success of the basic sectors in selling their output and thereby determining the level of employment and activity in the induced sectors. These induced sectors are construction; transportation, communications, and public utilities; finance, insurance, and real estate; wholesale and retail trade; various general services; and government.

Not all of the employment and sales of the induced sectors are the result of activity in the basic sectors. Some portion of each induced sector is basic. For example, part of government employment is generated by forces outside of Arizona. Parts of the service sector (restaurants, gasoline sales, etc.) are a direct result of the tourist trade. Therefore, that part of their activity is properly part of tourism when for example, some part of their business represents sales to non-Arizonans in the same sense that Arizona cotton may be sold to a Hong Kong textile firm.

Before discussing the key indicators and the sectors, it is important to specify the principal assumption on

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Overall, Arizona will continue a slow rate of recovery from the 1980 recession, but inflation will continue to stifle the real level of economic activity. This article discusses the expectations in key indicators and the role of various sectors of the Arizona economy in determining the state's future. This report was one of the presentations at the annual ASU Economic Forecast Luncheon on December 11.

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TABLE 1

THE ARIZONA ECONOMY:
VALUES OF KEY INDICATORS, 1978-1981

Key Indicators	*1978 Actual*	*1979 Actual*	*1980 Forecast*	*1980 Estimated*	*1981 Forecast*
Personal Income					
Current dollars (000,000)	17,586	20,637	24,570	23,000	26,000
Per capita	6,905	7,844	9,020	8,520	9,420
1969 dollars (000,000)	10,210	10,510	11,370	10,180	10,280
Per capita	4,010	3,990	4,170	3,770	3,720
Population (000)	2,547	2,631	2,725	2,700	2,760
Unemployment rate (percentage)	6.1	5.4	6.5	6.5	6.0
Metropolitan Phoenix CPI	172.2	196.6	216.0	226.0	253.0
Retail sales					
Current dollars (000,000)	10,760	12,740	15,400	13,750	15,500
1969 dollars (000,000)	6,250	6,480	7,130	6,080	6,130

Sources: Prepared from data provided by the U.S. Department of Commerce; Arizona Department of Economic Security; Valley National Bank; and the Bureau of Business and Economic Research, Arizona State University.

TABLE 2

THE ARIZONA ECONOMY:
PERCENTAGE RATES OF CHANGE IN KEY INDICATORS
1978-1981

	1979 Actual / 1978 Actual	*1980 Forecast / 1979 Estimated*	*1980 Estimated / 1979 Actual*	*1981 Forecast / 1980 Estimated*
Personal Income				
Current dollars	17.4	17.9	11.5	13.0
Per capita	13.6	13.1	8.6	10.6
1969 dollars	3.0	5.4	(3.1)	1.0
per capita	(0.5)	1.8	(5.5)	(1.3)
Population	3.3	3.5	2.6	2.2
Metropolitan Phoenix CPI	14.2	11.0	15.0	12.0
Retail sales				
Current dollars	18.4	18.3	7.9	12.7
1969 dollars	3.7	6.6	(6.2)	0.8

Source: All percentage rates of change calculated from Table 1 except 1980 Forecast column which was reported one year ago.

which this forecast of Arizona's economic activity is made — that the national economy will behave in 1981 as indicated by the preceding national forecast.

KEY INDICATORS

These indicators are the readily apparent measures of economic well-being. The levels attained by these indicators in 1978 and 1979, along with their estimated values for 1980, and the forecast values for 1981 are indicated in Table 1. The percentage changes in these indicators over the same time frame are given in Table 2.

Personal Income

Personal income serves as an excellent indicator of a state's economic progress, especially when corrected for population change via the calculation of per capita income and when corrected for inflation via application of the Consumer Price Index. The 1978 and 1979 data are a matter of record. The first column for 1980 shows the forecast for personal income made one year ago. The second 1980 column shows the current estimate for personal income based on data available over the first three quarters of 1980. The last column of Table 1 indicates the 1981 forecast value for personal income.

Based on the current estimate, personal income in 1980 will have increased about $2.4 billion or by 11.5 percent over 1979. This falls short of the 1980 forecast by about $1.6 billion. Correspondingly, per capita income, estimated at $8,520 also fell short of the 1980 forecast. Total personal income and per capita income in constant dollar terms also fell short of what was forecast. In fact, real personal income and real per capita income declined by 3.1 percent and 5.5 percent respectively. This was the third year in a row during which real per capita income declined. In general, this may be attributed to the 1980 recession which was a bit more severe than anticipated.

For 1980, the ASU forecasting model suggests that personal income will increase by 13 percent in current dollars, from $23 billion in 1980 to $26 billion in 1981. Per capita income in current dollars will increase by 10.6 percent to $9,420. However, because of anticipated increases in the local Consumer Price Index, personal income in constant 1969 dollars will only increase by 1 percent and real per capita income will once again decline, this time by 1.3 percent.

Metropolitan Phoenix CPI

Inflation continues to be a serious problem for the nation and even moreso for the Arizona economy. The Arizona State University forecasting model uses the Phoenix Consumer Price Index as a proxy for the state. Based on the first three quarters of 1980, the Phoenix CPI should average 226 for the year. This is ten full points above the 216 index forecast one year ago, which resulted from an anticipated 11 percent inflation over 1980. In fact, however, the final inflation figure for 1980 will be about 15 percent. The inflation rate is a variable that has been consistently underforecasted. The 15 percent actual as opposed to the 11 percent forecasted rate of inflation accounts for much of the 5.5 percent decline in real per capita income. The inflation outlook for 1981 in the state is again very sanguine. The forecasting model suggests only a 12 percent inflation rate and a rise in the average annual CPI from 226 to 253, but it is suggested that the 12 percent forecast will be the minimum for 1981.

Population

Arizona's population growth over the past decade has been among the highest of all states. This year's population of 2,700,000 is somewhat less than predicted a year ago but is the result of the recession's influence on migration. The population growth rate for 1981 will be about 2.2 percent compared to the 2.6 percent of 1980. While still high compared to the nation as a whole, Arizona's rate of population growth is slowing down. By mid-1981, population will reach 2,760,000.

Unemployment Rate

The average unemployment rate estimated for 1980 is 6.5 percent, the same as that forecasted last year thus verifying the anticipated recession. The ASU model forecasts a decline in the unemployment rate to 6 percent in 1981 anticipating a very mild recovery from the 1980 recession. Total employment is expected to reach more than one million jobs in 1981 out of a nonagricultural labor force that will consist of 1,085,000 people.

Retail Sales

The level of retail sales for 1980 is estimated at approximately $14 billion if retailers have the kind of Christmas season they are hoping for. This will be an increase of 8 percent over 1979 in current dollars but less than half of the 18 percent increase forecast a year ago. In constant dollar terms, retail sales declined 6.2 percent. Retail sales will improve somewhat next year when the figure will reach $15.5 billion, a 12.7 percent increase. However, the anticipated increase in the Phoenix CPI will reduce that figure to a real increase of less than 1 percent. (Paul Jones of Valley National Bank reports on consumer attitudes and retail sales later in this issue of *Arizona Business*.)

ECONOMIC SECTORS

This section presents a brief summary of 1980 and the 1981 outlook for major economic sectors of the Arizona economy.

Agriculture

Agriculture remains a strong partner in Arizona's economic progress. Rising prices for agricultural products should make 1981 a good year. Employment in agriculture will remain at the level of 23,000 workers; however, since the final resolution of Central Arizona Project water allocation has not been made, the agricultural sector must be viewed with some caution.

Mining

Arizona's mining sector is experiencing hard times. Current employment is down from what it was in 1979.

There are currently about 13,000 mining employees, which will increase slightly to about 14,000 next year. The slow economic recovery does not bode well for the copper mines. The problems of the automotive and construction sectors are real and deep and they affect copper severely. In addition, a glut of copper is evident worldwide. Mining in general will continue to be a diminishing sector of the Arizona economy.

Manufacturing

This sector has continued as a strong factor in the Arizona economy in spite of the recession. Employment has grown and stands at approximately 152,000. By the end of 1981, employment in manufacturing will be approximately 160,000, a good increase, but one that would be greater if national recovery were to occur at a brisker pace. (John Welty of Motorola presents a more in-depth report on manufacturing in Arizona later in this issue of *Arizona Business*.)

Tourism

Tourist expenditures in Arizona in 1980 were expected to hit the $4.6 billion level. Given the recession and gasoline prices that average $1.25 per gallon, this expected level probably will not be reached. Tourism, however, will still be a major sector of the economy because it accounts directly for nearly 75,000 jobs, plus a secondary effect on another 125,000 service and trade-related jobs. Tourist expenditures in 1981 will approach $5.25 billion given the mild economic recovery that will occur.

Construction

This sector began to feel the pinch of rising interest rates and its associated lack of funds more than a year ago. Since that time the construction industry has suffered through one period of record high interest rates and is currently feeling the impact of another. There is no immediate relief in sight for the state. Inflation and associated high rates of interest will plague the industry throughout 1981. Current employment stands at about 70,000. Employment will rise, but slowly, and will be in the range of 75,000 to 77,000 by the end of the year. The financial sector is being quite innovative (through variable-interest mortgages, for example) in order to attract funds into the mortgage market, but a shortage of funds combined with continually rising land and construction costs make if difficult. (Jackie Pettycrew of Phoenix Newspapers, Inc. will provide more information on construction and housing starts later in this issue of *Arizona Business*.)

Transportation, Communication, and Public Utilities

Employment in this sector now stands at about 49,000. This sector grows directly with population; hence by the end of 1981, employment will be at 51,000.

Wholesale and Retail Trade

This is the largest sector with respect to employment in the Arizona economy, accounting for close to one-fourth of all nonagricultural jobs. This sector grows directly with population and income. Currently, employment stands at close to 245,000. By the end of 1981, employment in trade will approach 250,000

Finance, Insurance, and Real Estate

Employment has expanded rapidly in this sector over the past several years and 1980 was no exception. Currently, employment stands at 57,000 and by the end of 1981 will be at least 59,000 as the demands for these important services increase with population and income.

Services

This sector is tied directly to tourism for many of the jobs it provides. Services follow only wholesale and retail trades in terms of total employment. Current employment is approaching the 200,000 level and by the end of 1981 will have increased another 3.5 percent to 207,000.

Government

This sector of Arizona's economy continues to grow. Growth of government is tied to population growth and economic growth; and for school districts, the age distribution of the population is crucial in determining service levels and employment. Most of the growth in government employment has occurred at the state and local level with federal employment virtually unchanged from a year ago. At present, government employment stands at about 203,000 and should increase by two or three thousand more by the end of 1981.

SUMMARY AND CONCLUSIONS

Total real personal income will rise, but per capita real income will fall for the third straight year. However, the rate of decline will be much less than it was in 1980. Overall, we will continue a slow rate of recovery from the 1980 recession, but inflation will continue to stifle the level of real economic activity. That will create a cost all Arizonans will share.

Economic Trends In Arizona for 1981

THREE VIEWS OF THE FUTURE

ARIZONA CONSUMERS

B. Paul Jones
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Valley National Bank

In each of the last three years, the President and the Congress have given the people of the United States a Christmas gift. The package has included:

- Explosive increases in federal spending
- Evermore onerous levies of federal taxes
- Huge budgetary deficits
- Rapid growth in the money supply to accommodate the financing of the mushrooming federal debt
- High and rising rates of inflation
- Spasmodic imposition of monetary policies designed to curb the money demands stemming from the excesses
- High and rising interest rates

During the annual ASU Economic Forecast Luncheon on December 11, three prominent local business people expressed their views on various facets of the Arizona economy. This article presents the remarks of the three participants with respect to the consumer's view of the future, the Metropolitan Phoenix economy, and the economic outlook for manufacturing.

Initiatives of October, 1979, represented a historic change in the conduct of monetary policy. The Federal Reserve declared its intention to control the growth of the money supply rather than interbank interest rates. Nevertheless, through the early part of 1980, the money supply grew excessively while interest rates fluctuated widely. In mid-March, the Federal Credit Restraint program was imposed. As a result, the economy collapsed. The money supply declined.

Seeing and fearing the results of their handiwork, the authorities flooded the system with new reserves. As the economy recovered, the money supply resumed its inordinately rapid growth. Inflationary expectations re-emerged. The Federal Reserve rededicated itself to controlling the growth of the money supply. Their efforts have yet to be successful, and interest rates have skyrocketed.

In 1980, the quarterly surveys of consumer attitudes and buying intentions conducted for the Valley National Bank by the Behavior Research Center have reflected the traumatic fluctuations in the national economy. The Arizona Consumer Confidence Index in April (taken after the mid-March Federal Credit Restraint program) dropped to 36, down sharply from the 52 level in January and the lowest point reached in the history of the index. The Confidence Index rose sharply to 52 in July and showed further improvement to the 60 level in the October survey. Yet, the Confidence Index remains below the range of 70 to 86 achieved in the years of 1976 through 1978.

The reasons for improved confidence are clear from the surveys. Looking six months ahead, the survey in April found that 65 percent of Arizonans felt the national economic situation would deteriorate. In the latest survey, only 33 percent felt that the economic situation would worsen in the coming six months.

In April, 53 percent of the respondents felt that there would be fewer jobs available in Arizona six months from that date. By October, only 14 percent of the respondents felt there would be fewer jobs available and 77 percent felt that there would be more or the same number of jobs available.

Arizona citizens have continued to appraise the outlook for inflation realistically. In the current survey, 89 percent felt that prices would increase over the coming year, and 30 percent felt that prices would increase sharply. Since January, 1977, over 80 percent of the survey respondents have consistently felt that prices would rise.

Attitudes toward wages and family incomes continue to be favorable. Ninety-five percent expect wages to be the same or higher during the coming year. Ninety percent expect family incomes to improve in the coming six months. However, the ravages of inflation are reflected in attitudes toward family financial situations. Only 39 percent feel the family financial situation will be better a year from now.

In response to the specific question "What concerns you the most about the economic situation?" inflation continued to dominate, with particular worries about prices for food, energy, utilities, and housing. Arizonans were distressed about taxes, wage levels, and unemployment.

Overall the consumer is a skeptical observer of the economic situation and is, at best, disenchanted.

The index of planned buying reflects the "roller coaster" economy and interest rate patterns of the last year. At the end of 1979, the consumer planned-buying index was 159. By April it had deteriorated to 119. As the economy recovered, the index rose to 167 in the summer. As inflation intensified and interest rates rose, the index slipped back to 146 at the latest reading. All major categories of consumer durable goods reflected the deterioration, with particular weakness in plans to purchase automobiles. Also scaled back were plans to purchase white goods (washers and dryers, dishwashers, refrigerator-freezers, ranges and ovens, water heaters and softeners, and disposals), brown goods (TVs, audio equipment, sewing machines, power tools and musical instruments), household goods and home improvements. Home buying plans slipped in the last half of the year.

Last year the Arizona forecast reported as follows:

"The consumer appears to be reacting quite logically to negative fundaments. He has begun to retrench. With recession the most likely prospect for 1980, the process of repairing the customer's position should require a number of months to complete. Consequently, we anticipate further slowing in the rate of growth in consumer spending in Arizona."

In 1980, retail sales in Arizona declined in real terms and in two months were actually lower in dollar terms than in the comparable months of the preceding year. The consumer's caution was reflected in the management of household debt. Although figures for the state are not available, consumer credit outstanding at the Valley National Bank is an excellent proxy. In the first quarter of 1980, consumer credit had reached $1.19 billion. By the third quarter, outstanding credit had declined to $1.18 billion. Normally, consumer credit would have been expanding rather than contracting.

The Arizona consumer will be entering 1981 with the economy restrained by monetary policy, high interest rates, and high inflation. Personal income will be growing, but more slowly than the rate of inflation. Real incomes continue to be eroded. The scheduled increases in social security taxes and personal income taxes through "bracket creep" will further impair family spendable incomes. With the increases in food and energy prices that are probable in 1981, more of family incomes will have to be dedicated to necessities.

The savings rate is about half of what it has been historically at this point of the business cycle. Consumers are still using over 17 percent of disposable incomes just to pay off previously accumulated debts. The process of retrenchment is continuing and will be a major influence in restraining consumer spending for at least the first part of next year.

However, in the past two months, consumer installment credit outstanding has begun to grow for the first time in 1980. This suggests that, although spending patterns will continue to be careful, spending patterns will be supported by previously accumulated savings and will be augmented by further increases in borrowing. It is likely that the tax burden will be moderated by a so-called tax cut later in the year. Thus, households are likely to be encouraged to leverage their increases in personal income to make larger investments in consumer durables, housing and financial assets in the last part of 1981.

The consumer surveys and the objective data support the thesis that 1981 should be a difficult year of

transition. By the end of the year consumer markets should be improving, and the year as a whole should show worthwhile gains over 1980. Once again, the Arizona consumer and the Arizona economy should outperform the nation as a whole.

THE METROPOLITAN PHOENIX ECONOMY

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Phoenix Newspapers, Inc.

This portion of the article discusses what has happened this year and what is expected to occur over the next twelve months in metropolitan Phoenix, with particular emphasis on developments in consumer economics and housing.

The *Arizona Republic* and The *Phoenix Gazette* have just completed a consumer survey, an extensive study into the components of household growth and development of the metropolitan area. Much of the data from that survey will be published in *Inside Phoenix 1981*, which will be released at the Symphony Hall presentation on March 18, 1981. Since the results are not yet in our hands, this article is based on preliminary tallies that are subject to some minor adjustments.

Median household income seems to have taken a tremendous upward surge since a similar study two years ago. The current figure is in excess of $22,000, an increase of about 37 percent over the 1978-1979 figure of $15,344. This cannot be verified until the hard data are in, but a major determinant is probably that the number of two-income households has also taken a quantum leap forward. Employment figures tend to substantiate this premise, especially when one considers the growth in the local electronics manufacturing sector and its higher salary scale.

Another interesting bit of information pertains to Phoenix area newcomers. Maricopa County residents who have lived here less than one year are currently estimated to stand at 6 percent of the total, or approximately 36,000 households. This percentage figure is lower than any other year throughout the 1970s, with the range traditionally falling between 9 and 12 percent; but, five years ago, during the last recession, newcomers dropped to 8 percent, or 37,000 households. The correlation between a tight economy and the ability of families to change their place of residence becomes quite obvious.

Valley National Bank's estimates of retail sales are additional evidence of our straitened economy. For the first three quarters of 1980, retail sales were posted at $6.2 billion, an increase of slightly more than 9 percent over the same nine months last year. By year's end Valley Bank's statisticians expect that the gain will amount to 9.9 percent, slightly less than the 11 percent that was predicted a year ago. For 1981, they project that retail dollars accrued in Metropolitan Phoenix should increase by 13.5 percent to $9.8 billion.

October employment figures from the Arizona Department of Economic Security (DES) were yet another reflection of the state of our economy. Although the metropolitan area's unemployment rate of 5.4 percent for October was more than 2 full percentage points below that of the nation as a whole, expected gains in the service and retail categories did not quite meet the mark as well as they did in 1979. DES estimates that growth of the labor force this year, as measured on a December-to-December basis, will only amount to 1.7 percent in the final analysis, one of the lowest rate gains in several years.

Housing

Tracking the mortgage rates became a rather unfunny game during the past twelve months, and those up-down-back-up-again numbers had their expected near disastrous effect on the housing market, not only locally, but nationally as well. Last year at this time, it was optimistically predicted that 30,000 new residential units were needed to fill the expected demand.

By March of this year, when Phoenix Newspapers' presentation was put before the public, the mortgage money situation had already begun to take its toll, and the estimate was revised downward to 21,500 permits, fortunately. Recent information from the Maricopa County Housing Study Committee report indicates that total permits through November amounted to approximately 20,700, making the revision a much more palatable figure.

Another factor came into play in the analysis of permit data. For the first time since the early 1960s, the ratio of single dwellings to multiples was just one point away from being a fifty-fifty split. The area has been a predominantly single-family-housing market for years, with newcomers demanding the "wide-open-spaces" concept that brought them west. Now, the economy has changed all that, and rental units are in greater demand as young couples and other new family formations find they must postpone home buying until their income and

the cost of borrowing money are more in agreeable alignment.

Because of the flurry of building activity in multiple units, the vacancy rate jumped from 3 percent at this time last year to the current 7 percent. This factor is helping to keep rental rate increases in check, at least for the next six to nine months. Builders should definitely conduct some in-depth analysis of all economic factors, both existing and projected, before putting themselves and the community into an overbuilt situation as far as apartment housing is concerned.

Pent-up demand, plus innovative approaches to financing that are either now in effect or in the planning stage, are certain to shift the proportion of residential housing back to past patterns over the next two years. For 1981, building permit figures are projected to reach at least 23,000 not only because of the supply-and-demand factor, but also because of a perceived willingness to arrive at a solution to the present money situation.

Conclusion

Certainly all residents of the Phoenix area can be proud to be a part of this great community. No other city in the nation can claim attendance figures at economic presentations such as those sponsored by the Arizona State University College of Business Administration and the spring meeting sponsored by Phoenix Newspapers, Inc. It is this interest in and devotion to the ordered growth of Phoenix that makes this community unique, and the prevailing attitude and cooperative spirit are the envy of other wishful community developers.

As Phoenix and the state continue to grow, sheer size demands that business leaders continue unremittingly to monitor all the component parts and take swift action to correct possible wrongs. Whether the aspect is cultural or criminal, economic or educational, there is a need to keep abreast of and implement fresh ideas that we feel will work.

A recent *U.S. News and World Report* carried a feature entitled, "The Next 20 Years." Here is an excerpt on changes foreseen in the way Americans work:

Work 'decentralization' is occurring even now, will pick up momentum...more people will toil at home, away from downtown offices. There'll be less need to go to the city, since computers, video terminals, other electronic tools will let white collar workers operate from any site...There'll be a demand for at-home office space in future houses and apartments, a concept architects, builders and developers are already latching onto.

Potentially staggering implications of this trend: downtown office space may be less essential...commercial and municipal parking lots will have empty slots...rush-hour traffic could become a memory...in-town restaurants, movies, stores face potential losses in trade...burglaries should dip, what with residents around more hours.

Granted, such effects aren't imminent. Not next year or year after, but taking shape now and sure to spread. Corporations will probably never eliminate the headquarters location, yet with growing numbers of people doing information-manipulating chores, it won't be as necessary to 'warehouse' large cadres of workers in town.

The preceding quote dealt with just one set of premises on one subject, but the ripple effect of this highly likely prediction would be enormous.

ARIZONA'S MANUFACTURING OUTLOOK FOR 1981

John R. Welty
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From all indications, Arizona's manufacturing community continued to enhance its position this year as the fastest growing segment of the state's economy.

As in past years, the statistics in this forecast article resulted from a survey of about twenty of the largest industrial employers in Arizona. Without a doubt, the numbers indicate that 1980 is another record year for Arizona's manufacturers. As a group, these companies have recorded healthy gains in all important parameters of measurement.

In looking forward to 1981, the numbers continue to reflect an air of cautious optimism which is prompted on one hand by the growth achieved this year, and on the other hand by growing concerns about the prospect for any speedy economic recovery in the United States and by the quick economic erosion taking place in several foreign economies, most notably in Western Europe. On balance, the responses to the survey were generally encouraging.

Key Indicators

Shipments. On the subject of order shipments, in 1979, the surveyed companies shipped about $3.6 billion worth of product to worldwide customers. That is about $600 million more — exactly 20 percent more — than they anticipated they would ship when they were

surveyed last year. Again, that is a reflection of the cautious optimism that has been prevalent over the past several years. This year, these same companies will ship about $4.2 billion, or 17 percent more than last year. For 1981, the companies expect to ship about $4.7 billion, an increase of nearly 10 percent over this year.

Backlog. In the order backlog category, the level continued to grow at a healthy pace. In 1979, the year-end backlog level was just under $3 billion, as the companies anticipated. This year, the backlog level will stand at $3.37 billion, for an increase of about 20 percent. Next year, the companies expect the level to reach $4.2 billion, for an increase of 24 percent. A large share of this increase is accounted for by the military/aerospace segment and reflects an expectation of increased federal spending for defense.

Employment. In employment, the same healthy trend exists. Last year, the surveyed companies represented an employment locally of just over 52,000. This year, they represent 55,600 employees, an increase of about 6 percent. In 1981, the companies expect to increase employment by another 9 percent, to a total of 60,700 employees.

Obviously, the state's manufacturing employment totals far more than 60,000 people, but this number includes only the twenty companies surveyed and does not include, for example, several important newcomers to the state who elected not to participate in the survey.

Exports. Shipments for foreign export also continued to grow this year. In 1979, the dollar value of goods manufactured in Arizona and exported to foreign markets totaled more than $781 million. This year, the number grew to over $922 million, for an increase of about 18 percent. For next year, the companies anticipate an 8 percent increase to just under $1 billion. Exports as a percentage of total shipments are also continuing to increase. It is about 19 percent this year, and may be nearly 21 percent in 1981.

This year it was again interesting to note the consistency of the projected growth statistics provided by the manufacturers. In all four categories — shipments, backlog, employment and exports — nearly all of the twenty companies reported fairly large increases over the forecasts they made last year, and again, they expect moderated growth next year.

Inhibiting Factors

As in past surveys, participants were also invited to comment on any factors they believe will inhibit the continued growth of the state manufacturing industry. On the local level, their comments focused on two areas. First, a major concern is the deteriorating highway and road maintenance program and, in light of steadily increasing population density, how an adequate maintenance program will eventually be funded. Second is the need for a prompt solution to the hazardous waste disposal issue, in terms of site selections and disposal methods.

On the national level, there is concern about the steadily increasing interest rates and their impact on the housing, automotive, and computer segments of the economy, all of which are keys to the health of our manufacturing community.

Then too, there is the continuing concern about steadily increasing government regulations which are inhibiting successful competition with foreign producers both in the United States and foreign markets. The hope was expressed by several companies that the Reagan administration would somehow be able to reverse the tide before it's too late.

Conclusions

Several important conclusions can be derived from our survey. First, most companies are expecting the second half of 1981 to be stronger than the first half, indicating a belief that full recovery from the United States recession will be slower than originally anticipated, and that a fair degree of sluggishness will continue at least through the first half of next year. Again, the sales growth of the twenty companies surveyed was 27 percent in 1979; 17 percent this year, and expected to be 10 percent next year. The scenario calls for continuing moderate growth.

Second, electronics continues to be the fastest growing segment of the state manufacturing industry; this is expected to continue will into the future. As a result, employment increases are heaviest in the technical skills area, which is also expected to continue in the future.

Finally, despite adverse economic conditions that may exist in the short term, the long-term outlook is extremely bright for manufacturing in Arizona. During the decade of the 1980s, dramatic increases can be expected in manufacturing activity throughout the state, which will greatly benefit all sectors of the state's economy.

As an example of this kind of manufacturing growth, this year, there is a single billion dollar manufacturing concern in the state; that is Motorola's Semiconductor

Group. Next year there will be two, as AiResearch crosses the billion dollar level. Both of these companies anticipate being at the two billion dollar level by 1985 or 1986, and by that time, there may be one or two more companies at the billion dollar level.

These very large companies, coupled with the hundreds of small and medium-sized companies that are either already here or will locate here, should provide an average annual growth rate larger than that of any other major economic sector.

The Arizona Business Scene

The Construction Industry in Arizona

Because Arizona is one of the most rapidly growing states in the country, the construction industry plays a major role in the state's economy. Construction employment in 1979 was 8.5 percent of Arizona's total employment, in contrast to only 5.2 percent of the nation's total employment; approximately 83,000 Arizonans were employed in the construction industry in 1979. These employees worked on construction valued at $2.6 billion, as measured by building permits. An estimate of the total value of construction contracts awarded in 1979, including nonbuilding construction such as highways and bridges, was $3.5 billion.[1]

The construction industry in Arizona is an unstable industry, however, and responds to general economic conditions as evidenced by swings in construction employment, building permit valuations, and new housing starts. During the recession of the mid-1970s, 31,000 construction jobs were lost in Arizona. From the peak employment level in 1973 to the lowest level in early 1976, construction employment dropped 45 percent Unemployment of this magnitude places a strain on the entire economy of the state. It was not until 1978 that construction employment reached its previous peak, set five years earlier. In late 1979, construction employment once again began to drop, and by August, 1980, nearly 15,000 construction workers across the state became unemployed. A slight increase in construction employment occurred in September, marking August's employment level as perhaps the lowest in the current recession.

The cyclical nature of the industry is also obvious in the fluctuations in building permit valuations caused mainly by residential and commerical construction (Table 1). Residential construction tends to slump and recover several months before commercial construction, helping to spread out the shock to the local economy of a sudden construction slump. Industrial and Other (public buildings, fences, swimming pools, etc.) building permits are more stable, also helping to buffer the economy from sudden construction slumps.

TABLE 1

ARIZONA BUILDING PERMIT VALUATIONS
(in millions of dollars)

Year	*Residential*	*Commercial*	*Industrial*	*Other*	*Total*
1974	457.8	389.4	41.5	149.2*	1,037.7*
1975	406.6	201.6	43.2	169.9	821.2
1976	544.5	233.4	39.4	176.8	994.2
1977	1,096.3	284.6	43.0	252.4	1,676.4
1978	1,482.5	542.2	77.1	288.0	2,389.8
1979	1,328.9	762.2	178.4	387.3	2,620.9
1980P	1,130.0	720.0	150.0	400.0	2,400.0

P = Projected

*Omits a single building permit for $500 million.

Source: Bureau of Business and Economic Research, College of Business Administration, Arizona State University.

In the mid-1970s, building permit valuations fell considerably from the peak that was reached in 1973. This drop was caused by major declines in residential and commercial construction: Residential construction began to slump in 1974; commercial construction fol-

lowed in 1975. The same pattern is repeating itself now, as residential construction began to decline in 1979, but commercial construction remained strong until the middle of 1980.

New housing starts in Arizona have a pattern similar to that of building permits, as shown in Table 2. Construction of single family residences slumps at the beginning of a recession, followed by construction of apartments (multiple units). A sharp, but relatively short decline in new house construction occurred in late 1979 and early 1980. Construction of multifamily units slowed in early 1980 and is still quite depressed.

TABLE 2

ARIZONA NEW HOUSING STARTS

Year	*Single Family*	*Multiple Units*	*Total Housing Units*
1974	23,282	13,977	37,359
1975	19,326	2,948	22,274
1976	22,844	5,217	28,061
1977	38,473	8,514	46,987
1978	51,104	18,247	69,351
1979	44,542	19,241	63,783
1980P	31,000	13,000	44,000

P = Projected

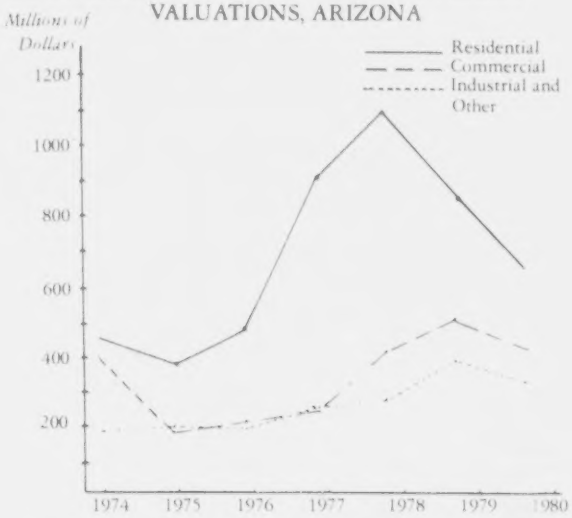
Source: Bureau of Business and Economic Research, College of Business Administration, Arizona State University.

The construction industry fluctuates because of its dependence on interest rates and the availability of financing. Typically at the beginning of a recession, interest rates increase and funds become less available for construction loans. This is followed by a decrease in demand for housing and for commercial developments due to the high interest rates and concern over future conditions by both businesses and the general public. All of these factors combine to postpone plans for new construction, resulting in a layoff of construction workers.

Despite the irregularity of the construction industry, the industry in Arizona is growing both in employment and in the number and value of construction permits. Construction employment grew at an average annual rate of 9.3 percent from 1970 to 1979, more rapidly than the construction industry nationwide and more rapidly than overall employment in Arizona. Building permit valuations, even after adjusting for the rapid inflation of the 1970s, show an upward trend, as illustrated in Figure 1. A similar growth pattern has occurred in the construction of new housing units.

FIGURE 1

INFLATION ADJUSTED BUILDING PERMIT VALUATIONS, ARIZONA



Source: Computed from Table 1 and the Metropolitan Phoenix Consumer Price Index, Bureau of Business and Economic Research, College of Business Administration, Arizona State University.

In addition to the cyclic nature of the industry and its long term growth, within any given year the industry will exhibit some seasonality due almost entirely to residential construction. Residential construction tends to slow down during autumn and winter, with an increase in activity in the spring and summer. This seasonal pattern is not strong enough to affect employment, however, except for a slight slowdown in growth at the end of the year.

The construction industry in Arizona is a boom industry, but one subject to potentially severe slumps. It is currently experiencing one of those slumps, the only Arizona industry in the current recession to be so affected.

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[1]Reported in *Dodge Construction Potentials*, F.W. Dodge Division, McGraw-Hill Information Systems.

A Survey of Arizona Business Conditions

HAROLD FEARON

The economy continued to gain strength in November, according to results from the monthly business survey of the Purchasing Management Association of Arizona. The upswing has been moderate so far, although all indicators of economic activity continue positive for the third consecutive month. Unfortunately, inflation shows no sign of abating and will make it difficult for the recovery to score major gains in the immediate future.

The purchasing business survey now is in its nineteenth year of consecutive monthly reporting on the current status of the Arizona economy. Data are gathered through a questionnaire sent at the close of each month to purchasing managers throughout the state, asking them to indicate the direction of activity — higher, unchanged, or lower — on six key indicators of economic activity in the month just ended. Since these purchasing managers deal daily with the forces of supply and demand, they are in a prime position to provide timely and accurate information on current business trends, enabling economic turning points to be spotted.

Prices paid for major purchased items followed the same, monotonous upward path in November. The increase rate was consistent with the previous month, with 59 percent of the purchasing managers reporting higher prices; 38 percent saying prices were unchanged; and only 3 percent indicating they paid lower prices in November compared to October. While the inflation rate did moderate somewhat in the third quarter of the year at the low point of the recession, the recovery has now pushed the inflation rate up again; November was the fourth month in a row that the rate of inflation has increased. It appears unlikely that much headway in the battle against inflation will be made in the immediate future, and this will make it difficult for a really robust recovery to get underway.

Delivery time on shipments from vendors is still stretching out, as vendor order books begin to reflect the stronger rate of economic activity. The November increase was the same as in the previous month, with 28 percent reporting faster deliveries, while only 13 percent said their firm received faster service from vendors in November than in October. This was the fourth month in a row that lead times have increased.

Inventory levels of purchased materials increased in November, reversing a seven-month downward trend, as 32 percent of the firms added to stocks, compared to the 22 percent who continued to liquidate inventory. Continued inventory additions are likely to occur over the next several months with firms beginning to build stock levels to meet the higher operating rates required by customer demands. These inventory increases will provide additional stimulus to the recovery.

New orders received from customers continued to increase for the fourth consecutive month, but the net increase rate was down somewhat from the last two months and the smallest since last August. Of the firms

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surveyed, 30 percent booked more new business in November than in October, but 24 percent saw a decrease in the rate at which they received incoming business. This shows that the economic recovery is proceeding at a more moderate pace than in previous upswings.

Production continued to increase in November, as needed to meet higher customer demand, and at a rate consistent with the previous month. This was the fourth consecutive monthly increase, with higher production reported by 35 percent of the firms, which was twice as many as the 17 percent who cut back output. This is an encouraging sign, although such production increases can be maintained only if the new order rate gets stronger over the next several months.

Employment of Arizona firms increased again for the third month in a row, although the month-to-month increase rate was down somewhat from October. Higher employment was reported by 22 percent of the firms, compared to 13 percent who pared payrolls. Additional increases are dependent on the new order increases registered over the next few months.

Thus, the November figures paint a picture of an economy that is moving in an upward direction, although the overall recovery seems weak. The Arizona economy will close out the year on a positive note, but the strength and duration of the recovery still are in doubt. The next few months will be watched very closely as an indicator of the overall strength and resiliency of the current upswing.

The results of the November survey are shown in Table 1.

TABLE 1

NOVEMBER PURCHASING SURVEY

	Percent of Purchasing Managers Indicating Each Response (November compared to October)		
Key Indicators	*Higher*	*Same*	*Lower*
Prices paid for major commodities	59	38	3
Delivery time from vendors	28	59	13
Purchased materials inventory level	32	46	22
New orders received	30	46	24
Production	35	48	17
Employment	22	65	13

Source: Survey of the Purchasing Management Association of Arizona.

ARIZONA SALES OF ELECTRICAL POWER

By Months

(In millions of kwh)

	Actual		*Percent Change Current Month From*	
	1980	*1979*	*Same Month Previous Year*	*Previous Month*
October	2,288.2	2,265.0	1.02	-14.33

Source: Based on reports from major suppliers.

OCTOBER, 1980

Arizona Building Permits: Monthly Report

	RESIDENTIAL*		COMMERCIAL		INDUSTRIAL		OTHER		TOTAL	
	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value
APACHE COUNTY	14	158,000	—	—	1	100,000	2	103,000	17	361,000
Eagar	2	88,000	—	—	1	100,000	1	100,000	4	288,000
St. Johns	6	N/C	—	—	—	—	—	—	6	N/C
Springerville	4	N/C	—	—	—	—	—	—	4	N/C
Uninc. Apache County	2	70,000	—	—	—	—	1	3,000	3	73,000
COCHISE COUNTY	106	2,701,294	8	358,483	1	12,500	139	260,283	254	3,332,560
Benson	4	61,500	—	—	—	—	6	4,650	10	66,150
Bisbee	4	15,700	—	—	—	—	17	11,000	21	26,700
Douglas	17	709,168	2	171,633	—	—	15	49,297	34	930,098
Huachuca City	9	12,725	1	94,000	—	—	—	—	10	106,725
Sierra Vista	20	498,417	—	—	—	—	86	152,468	106	650,885
Tombstone	6	8,000	4	2,850	—	—	5	2,040	15	12,890
Uninc. Cochise Co.	45	1,394,784	—	—	—	—	9	38,828	54	1,433,612
Willcox	1	1,000	1	90,000	1	12,500	1	2,000	4	105,500
COCONINO COUNTY	170	3,490,598	17	570,468	1	3,000	49	326,583	237	4,390,649
Flagstaff	41	1,652,872	13	469,941	—	—	38	292,063	92	2,414,876
Fredonia	3	32,500	—	—	—	—	—	—	3	32,500
Page	20	68,945	2	29,500	1	3,000	6	29,500	29	130,945
Uninc. Coconino Co.	105	1,697,531	2	71,027	—	—	1	3,000	108	1,771,558
Williams	1	38,750	—	—	—	—	4	2,020	5	40,770
GILA COUNTY	91	1,135,891	3	445,408	—	—	16	19,800	110	1,601,099
Globe	7	73,500	1	290,000	—	—	5	14,700	13	378,200
Hayden	2	2,000	—	—	—	—	1	100	3	2,100
Miami	4	2,800	—	—	—	—	—	—	4	2,800
Payson	34	323,901	1	135,408	—	—	10	5,000	45	464,309
Uninc. Gila Co.	44	733,690	1	20,000	—	—	—	—	45	753,690
GRAHAM COUNTY	31	595,715	3	497,475	—	—	3	700	37	1,093,890
Pima	—	—	—	—	—	—	—	—	—	—
Safford	8	50,785	1	226,000	—	—	3	700	12	277,485
Thatcher	6	233,000	1	240,000	—	—	—	—	7	473,000
Uninc. Graham Co.	17	311,930	1	31,475	—	—	—	—	18	343,405
GREENLEE COUNTY	8	278,645	—	—	—	—	—	—	8	278,645
Clifton	—	—	—	—	—	—	—	—	—	—
Duncan	1	1,250	—	—	—	—	—	—	1	1,250
Uninc. Greenlee Co.	7	277,395	—	—	—	—	—	—	7	277,395
MARICOPA COUNTY	2,260	61,715,627	162	39,687,969	58	29,517,082	1,535	33,465,011	4,015	164,381,689
Avondale	1	N/C	—	—	—	—	15	59,180	16	59,180
Buckeye	5	125,000	2	1,102,300	—	—	1	24,900	8	1,252,200
Chandler	126	3,840,145	1	18,800	1	75,000	143	3,557,289	271	7,491,232
El Mirage	3	50,000	—	—	—	—	—	—	3	50,000
Gila Bend	2	3,100	3	650,000	—	—	1	600	6	653,700
Gilbert	17	540,054	1	135,000	—	—	24	2,028,923	42	2,703,977
Glendale	106	2,327,300	21	2,483,600	—	—	196	546,770	323	5,357,670
Goodyear	—	—	—	—	1	1,395,228	8	19,100	9	1,414,328
Guadalupe	1	2,280	—	—	—	—	—	—	1	2,280
Mesa	119	3,433,716	12	1,977,727	2	477,000	254	4,771,430	387	10,659,873
Paradise Valley	27	2,051,170	—	—	—	—	16	349,626	43	2,400,796
Peoria	16	422,851	2	56,000	—	—	19	51,731	37	530,582
Phoenix	671	19,689,768	41	20,493,883	20	19,852,497	465	19,067,121	1,197	79,103,269
Scottsdale	197	9,826,083	19	6,811,809	1	1,370,757	180	1,160,159	397	19,168,808
Surprise	7	31,800	—	—	—	—	5	1,525	12	33,325
Tempe	151	3,528,600	33	2,959,600	33	6,346,600	80	1,141,600	297	13,776,400
Tolleson	3	3,220	—	—	—	—	—	—	3	3,220
Uninc. Maricopa Co.	781	15,761,506	27	2,999,250	—	—	127	682,467	935	19,443,223
Wickenburg	6	127,500	—	—	—	—	—	—	6	127,500
Youngtown	21	149,536	—	—	—	—	1	590	22	150,126

Arizona Building Permits: Monthly Report (Continued)

OCTOBER, 1980	RESIDENTIAL*		COMMERCIAL		INDUSTRIAL		OTHER		TOTAL	
	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value
MOHAVE COUNTY	361	5,946,947	27	1,427,404	—	—	282	460,055	670	7,834,406
Kingman City	27	552,023	5	186,896	—	—	6	80,725	38	819,644
Kingman Area	59	715,834	2	161,280	—	—	55	71,580	116	948,694
Lake Havasu City	74	2,161,543	8	640,718	—	—	12	65,720	94	2,867,981
Lake Havasu Area	27	267,958	—	—	—	—	19	21,555	46	289,513
Mohave Valley North	99	1,401,207	10	423,534	—	—	114	128,735	223	1,953,476
Mohave Valley South	49	539,292	—	—	—	—	54	66,503	103	605,795
Dolan Springs	15	146,704	—	—	—	—	9	17,384	24	164,088
Sacramento Valley	9	95,387	—	—	—	—	13	7,853	22	103,240
Mohave County General	2	66,999	2	14,976	—	—	—	—	4	81,975
NAVAJO COUNTY	106	1,828,936	4	742,157	—	—	7	180,620	117	2,751,713
Holbrook	7	271,500	—	—	—	—	—	—	7	271,500
Show Low	9	64,988	1	27,000	—	—	1	60,000	11	151,988
Snowflake	6	N/C	—	—	—	—	—	—	6	N/C
Taylor	2	90,000	—	—	—	—	—	—	2	90,000
Uninc. Navajo Co.	69	1,256,148	2	661,157	—	—	5	89,620	76	2,006,925
Winslow	13	146,300	1	54,000	—	—	1	31,000	15	231,300
PIMA COUNTY	1,114	35,305,879	50	33,291,377	—	—	692	4,778,418	1,856	73,375,674
Marana	1	N/C	—	—	—	—	—	—	1	N/C
Oro Valley	1	90,000	—	—	—	—	—	—	1	90,000
South Tucson	19	39,655	5	17,000	—	—	—	—	24	56,655
Tucson	318	5,184,340	16	13,812,277	—	—	245	3,189,989	579	22,186,606
Uninc. Pima Co.	775	29,991,884	29	19,462,100	—	—	447	1,588,429	1,251	51,042,413
PINAL COUNTY	110	1,210,640	2	110,000	2	2,008,500	37	192,933	151	3,522,073
Casa Grande	16	522,227	—	—	1	2,000,000	3	9,200	20	2,531,427
Coolidge	11	22,322	—	—	—	—	1	—	12	22,322
Eloy	2	5,500	—	—	1	8,500	—	—	3	14,000
Florence	2	5,000	—	—	—	—	—	—	2	5,000
Kearny	3	6,000	—	—	—	—	1	62,000	4	68,000
Mammoth	—	—	—	—	—	—	—	—	—	—
Superior	6	14,250	—	—	—	—	5	5,450	11	19,700
Uninc. Pinal Co.	70	635,341	2	110,000	—	—	27	116,283	99	861,624
SANTA CRUZ COUNTY	11	353,412	—	—	1	725,000	5	26,700	17	1,105,112
Nogales	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
Patagonia	3	16,500	—	—	—	—	1	1,000	4	17,500
Uninc. Santa Cruz Co.	8	336,912	—	—	1	725,000	4	25,700	13	1,087,612
YAVAPAI COUNTY	262	5,935,148	14	1,254,333	1	37,000	110	451,291	387	7,677,772
Chino Valley	15	216,900	2	210,000	—	—	4	9,150	21	436,050
Clarkdale	2	55,500	—	—	—	—	—	—	2	55,500
Cottonwood	18	150,025	—	—	1	37,000	5	71,800	24	258,825
Jerome	1	2,400	—	—	—	—	1	1,000	2	3,400
Prescott	52	736,497	5	321,269	—	—	68	291,862	125	1,349,628
Uninc. Yavapai Co.	146	4,371,442	6	700,600	—	—	32	77,479	184	5,149,521
Prescott Valley	28	402,384	1	22,464	—	—	—	—	29	424,848
YUMA COUNTY	169	2,030,842	13	2,736,035	1	109,190	22	302,889	205	5,178,956
Parker	1	37,000	—	—	—	—	1	900	2	37,900
Somerton	4	55,700	1	20,000	—	—	2	2,000	7	57,700
Uninc. Yuma Co.	111	1,217,392	5	1,441,777	1	109,190	9	88,444	126	2,856,803
Wellton	1	15,000	1	12,000	—	—	—	—	2	27,000
Yuma	52	725,750	6	1,262,258	—	—	10	211,545	68	2,199,553
TOTAL Maricopa County, October, 1980	2,260	61,713,627	162	39,687,969	58	29,517,082	1,535	33,463,011	4,015	164,381,689
TOTAL Maricopa County, October, 1979	2,284	62,094,666	138	33,265,959	45	16,378,626	2,089	21,167,767	4,556	132,907,018
PERCENT CHANGE	-1	-1	17	19	29	80	-27	58	-12	24
TOTAL Arizona, October, 1980	4,813	122,685,574	303	81,121,109	66	32,512,272	2,899	40,566,285	8,081	276,885,238
TOTAL Arizona, October, 1979	5,354	108,586,119	267	67,220,803	49	16,714,626	2,933	26,909,037	8,603	219,430,585
PERCENT CHANGE	-10	13	13	21	35	95	-1	51	-6	26

*Includes mobile homes

N/C: Not Collected

N/R: No report; data for this month will be combined with data reported for the following month.

Arizona New Housing Starts: Monthly Report

OCTOBER, 1980

	BUILDING PERMITS ISSUED				
	1* Family	Duplex	3-4 Families	5 or More	Housing Units
APACHE COUNTY	14	—	—	—	14
Eagar	2	—	—	—	2
St. Johns	6	—	—	—	6
Springerville	4	—	—	—	4
Uninc. Apache Co.	2	—	—	—	2
COCHISE COUNTY	69	—	—	—	69
Benson	2	—	—	—	2
Bisbee	—	—	—	—	—
Douglas	10	—	—	—	10
Huachuca City	—	—	—	—	—
Sierra Vista	17	—	—	—	17
Tombstone	1	—	—	—	1
Uninc. Cochise Co.	39	—	—	—	39
Willcox	—	—	—	—	—
COCONINO COUNTY	106	1	2	—	115
Flagstaff	28	1	2	—	57
Fredonia	2	—	—	—	2
Page	14	—	—	—	14
Uninc. Coconino Co.	62	—	—	—	62
Williams	—	—	—	—	—
GILA COUNTY	57	—	1	—	60
Globe	1	—	—	—	1
Hayden	—	—	—	—	—
Miami	—	—	—	—	—
Payson	25	—	1	—	26
Uninc. Gila Co.	33	—	—	—	33
GRAHAM COUNTY	19	—	—	—	19
Pima	—	—	—	—	—
Safford	1	—	—	—	1
Thatcher	4	—	—	—	4
Uninc. Graham Co.	14	—	—	—	14
GREENLEE COUNTY	7	—	—	—	7
Clifton	—	—	—	—	—
Duncan	—	—	—	—	—
Uninc. Greenlee Co.	7	—	—	—	7
MARICOPA COUNTY	1,455	15	32	47	2,295
Avondale	1	—	—	—	1
Buckeye	4	—	—	1	64
Chandler	100	—	—	—	100
El Mirage	3	—	—	—	3
Gila Bend	—	—	—	3	36
Gilbert	11	—	—	—	11
Glendale	73	—	2	8	265
Goodyear	—	—	—	—	—
Guadalupe	—	—	—	—	—
Mesa	70	10	2	3	119
Paradise Valley	14	—	—	—	14
Peoria	14	—	—	—	14
Phoenix	418	4	20	10	685
Scottsdale	160	—	1	13	276
Surprise	2	—	—	—	2
Tempe	70	—	4	9	180
Tolleson	—	—	—	—	—
Uninc. Maricopa Co.	508	—	3	—	520
Wickenburg	3	—	—	—	3
Youngtown	2	1	—	—	4

*Includes Mobile Homes

N.R. No report; data for this month will be combined with data reported for the following month.

	BUILDING PERMITS ISSUED				
	1* Family	Duplex	3-4 Families	5 or More	Housing Units
MOHAVE COUNTY	219	3	—	2	258
Kingman City	16	—	—	—	16
Kingman Area	36	3	—	—	42
Lake Havasu City	56	—	—	1	64
Lake Havasu Area	15	—	—	—	15
Mohave Valley North	52	—	—	1	57
Mohave Valley South	30	—	—	—	30
Dolan Springs	6	—	—	—	6
Sacramento Valley	6	—	—	—	6
Mohave Co. General	2	—	—	—	2
NAVAJO COUNTY	77	—	—	—	77
Holbrook	4	—	—	—	4
Show Low	9	—	—	—	9
Snowflake	4	—	—	—	4
Taylor	2	—	—	—	2
Uninc. Navajo Co.	49	—	—	—	49
Winslow	9	—	—	—	9
PIMA COUNTY	816	8	2	5	1,088
Marana	1	—	—	—	1
Oro Valley	1	—	—	—	1
South Tucson	—	—	—	—	—
Tucson	158	8	1	5	427
Uninc. Pima Co.	656	—	1	—	659
PINAL COUNTY	65	—	2	—	75
Casa Grande	12	—	—	—	12
Coolidge	2	—	—	—	2
Eloy	—	—	—	—	—
Florence	—	—	—	—	—
Kearny	—	—	—	—	—
Mammoth	—	—	—	—	—
Superior	—	—	—	—	—
Uninc. Pinal Co.	51	—	2	—	59
SANTA CRUZ COUNTY	7	—	—	—	7
Nogales	N.R.	N.R.	N.R.	N.R.	N.R.
Patagonia	2	—	—	—	2
Uninc. Santa Cruz Co.	5	—	—	—	5
YAVAPAI COUNTY	164	—	5	—	176
Chino Valley	9	—	—	—	9
Clarkdale	1	—	—	—	1
Cottonwood	6	—	—	—	6
Jerome	—	—	—	—	—
Prescott	16	—	5	—	28
Uninc. Yavapai Co.	112	—	—	—	112
Prescott Valley	20	—	—	—	20
YUMA COUNTY	70	—	3	1	91
Parker	1	—	—	—	1
Somerton	—	—	—	—	—
Uninc. Yuma Co.	55	—	—	—	55
Wellton	1	—	—	—	1
Yuma	13	—	3	1	34
TOTAL, Maricopa Co., October, 1980	1,455	15	32	47	2,295
TOTAL, Maricopa Co., October, 1979	1,499	27	28	27	2,268
PERCENT CHANGE	-3	-44	14	74	1
TOTAL, Arizona, October, 1980	3,145	27	45	55	4,329
TOTAL, Arizona, October, 1979	3,165	41	39	38	4,536
PERCENT CHANGE	-1	-34	15	45	-5

Maricopa County Retail Food Prices

NOVEMBER, 1980

Retail food prices in Maricopa County rose 0.8 percent in November following a 0.3 percent gain in October.

The food price survey is compiled by the Bureau of Business and Economic Research, College of Business Administration, Arizona State University. Cosponsor of the study is Valley National Bank. The November index of 252.2 indicates that shoppers would now have to pay $25.22 for a similar basket of foods that would have cost $10.00 in 1967. These foods could have been purchased for $22.63 one year ago. The November, 1980, index reflects an 11.5 percent increase over the November, 1979, value.

The gain in this month's index value was due to increases in the subgroups *Other Foods* (1.5 percent), *Meats, Poultry, Fish, and Eggs* (1.3 percent), *Dairy Products* (1.3 percent), and *Cereals and Bakery Products* (1.1 percent). Partially offsetting these increases was a drop in *Fruits and Vegetables* (-2.3 percent).

Sharp increases in several categories of *Other Foods* contributed to that subgroup's overall gain. Largest increases were posted in the category of sweets (excluding candy, gum, sugar, and sweeteners), which rose 8.7 percent. Similar increases occurred in the category of other canned, packaged, prepared foods (7.4 percent). In addition, higher prices for powdered soft-drink mixes were responsible for the increase of 6.0 percent for other noncarbonated beverages (excluding coffee). Falling prices were noted for margarine (-2.5 percent) and nuts, potato chips, and other snacks (-2.5 percent).

Climbing prices for pork and beef contributed to gains in *Meats, Poultry, Fish, and Eggs* in November. Bacon prices jumped 12.4 percent, followed by sirloin steak (3.0 percent), chuck roasts (2.9 percent), and noncanned ham (2.9 percent). These increases were partially counteracted by lower prices for frankfurters (-3.3 percent), fresh or frozen chicken parts (-3.1 percent), and fresh whole chicken (-1.9 percent).

Prices in all categories of *Dairy Products* were higher this month, notably cheese (1.7 percent) and fresh milk and cream (1.2 percent). Most prices in *Cereals and Bakery Products* were also higher. Gains were posted for white bread (3.4 percent), sweet rolls, coffee cake, and doughnuts (2.3 percent), and fresh biscuits, rolls, and muffins (2.1 percent).

Seasonal fluctuations were largely responsible for price reductions this month in *Fruits and Vegetables*. Prices for tomatoes plunged -39.9 percent, followed by lettuce (-19.3 percent), apples (-18.9 percent), and potatoes (-11.6 percent). These changes were only partially offset by rising prices for oranges (13.1 percent) and bananas (10.9 percent).

A comparison of the August Food Consumed at Home Index for Maricopa County with index values for four selected metropolitan areas reveals that outlays required to purchase a foodstuffs group in August, 1980 (obtainable for an outlay of $10.00 at 1967 average prices) were $24.47 in Maricopa County; $25.43 in Los Angeles-Long Beach; $25.55 in San Francisco-Oakland; $25.79 in Chicago-Northwestern Indiana; and $25.63 in the United States (average).

INDEX FOR FOOD CONSUMED AT HOME
(Average 1967 = 100 percent)

Group	*Maricopa County Nov. '80*[a]	*Maricopa County Aug. '80*[b]	*United States*[a] *Aug. '80*	*Los Angeles-Long Beach*[a] *Aug. '80*	*San Francisco-Oakland*[a] *Aug. '80*	*Chicago Northwestern Indiana*[a] *Aug. '80*
Food Consumed at Home	252.2	244.7	256.3	254.3	255.5	257.9
Cereals and Bakery Products	237.3	233.5	249.2	260.1	253.2	256.2
Meats, Poultry, Fish, and Eggs	261.6	253.0	245.4	247.7	251.9	251.1
Dairy Products	220.0	211.4	229.7	224.8	223.9	226.3
Fruits and Vegetables	231.2	225.9	258.4	236.4	242.4	258.6
Other Foods Consumed at Home	281.0	272.6	307.8	303.9	312.6	310.7

[a]Computed from data contained in *The Consumer Price Index*, U.S. Department of Labor, Bureau of Labor Statistics, Washington D.C.
[b]Maricopa County food prices are reported for the month closest to publication.
[b]Comparisons of food prices among various cities and the United States average are made on the basis of earlier months because of the lag in collecting price reports from these other areas.
Note: Index comparisons between Maricopa County and the other regions show only that food prices in Maricopa County have increased more or less than food prices in the other regions since 1967. Indexes cannot be used to determine actual differences in food price levels between regions.
Source: Bureau of Business and Economic Research, College of Business Administration, Arizona State University, in cooperative cosponsorship with Valley National Bank.

Arizona Business Index
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Arizona Building Permits: Monthly Report, (All Issues)

Arizona Building Permits: Quarterly Report, May, p. 30; August/September, p. 26; November, p. 30.

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_____, "College of Business Administration: Twenty-Five Years of Service," February, p. 25.

_____, "Arizona Tourism: A $4 Billion Year in 1979," March, p. 25.

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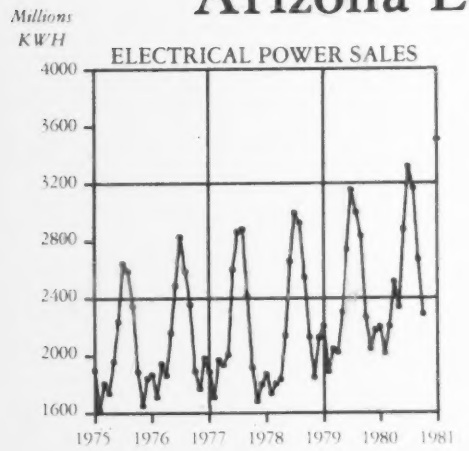

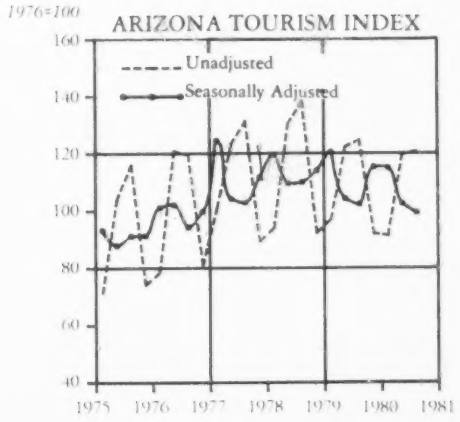

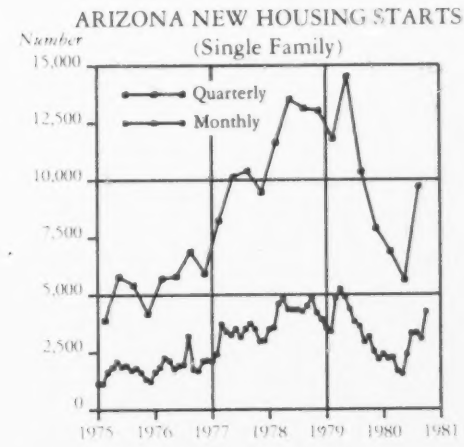

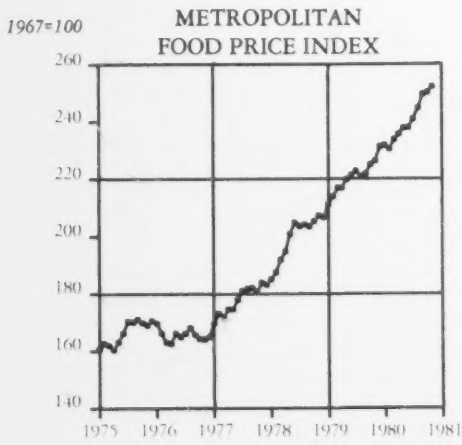

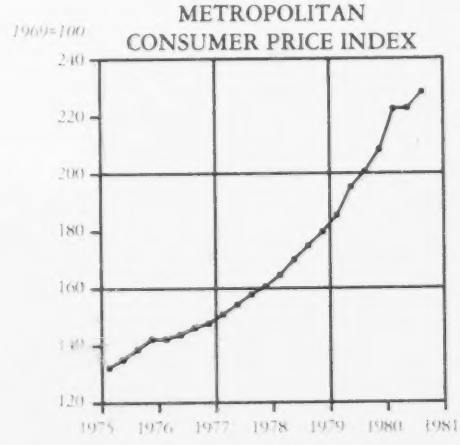

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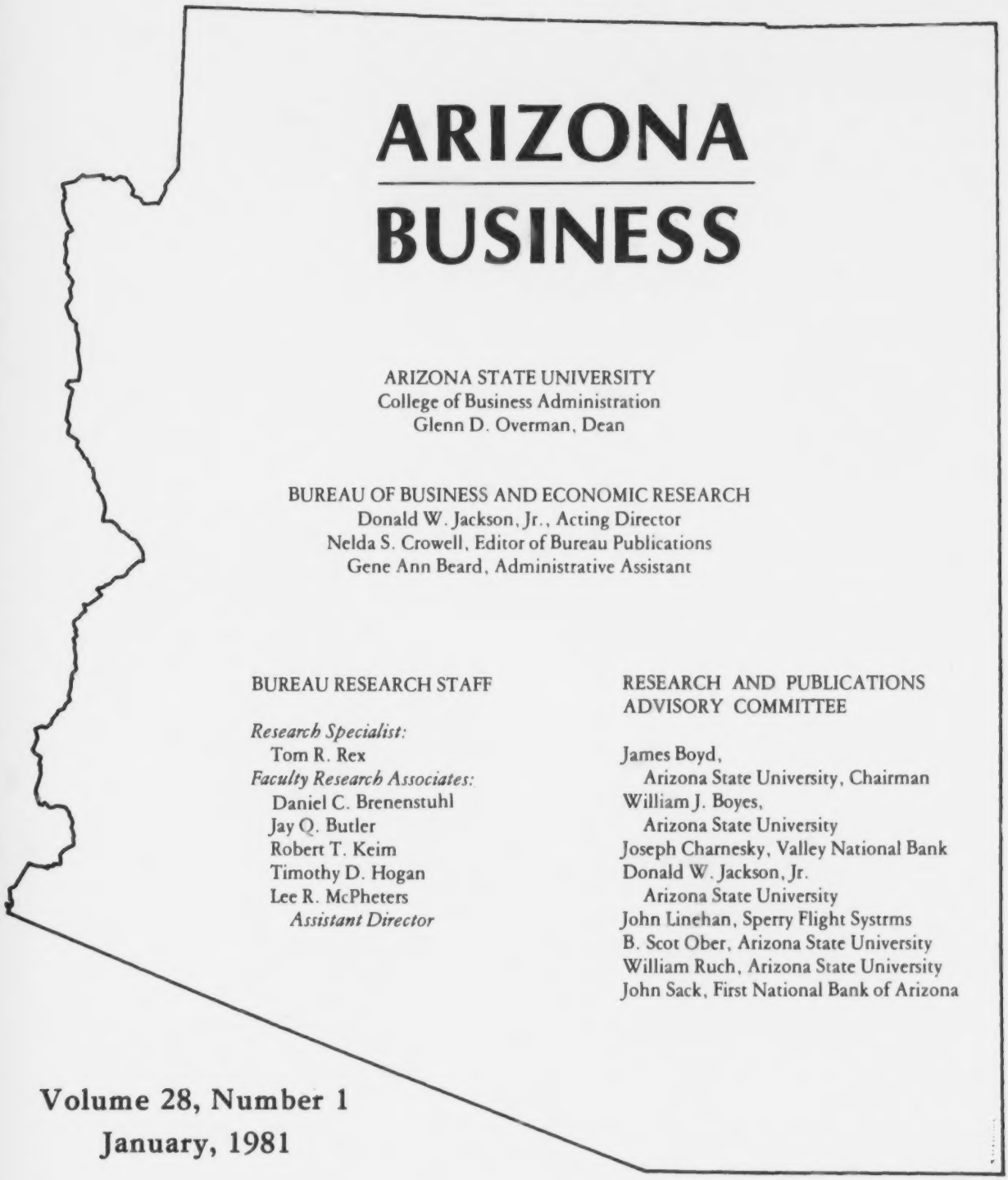

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Report To The Reader

The Bureau of Business Research at West Virginia University recently announced the publication of the 1980 *AUBER Bibliography*. An excellent reference source for anyone interested in the fields of business and economics, the *Bibliography* lists over 2,400 publications such as books, articles, and monographs from 116 college and university research organizations across the United States including publications produced during the 1979 calendar year. Volume XXIV cites works from institutions of higher education in both the Association for University Business and Economic Research (AUBER) and the American Assembly of Collegiate Schools of Business.

Researchers and other users will find the *AUBER Bibliography* covering more than 125 subjects, with the largest number of entries in such categories as business and public administration, international business, marketing and advertising, regional economics, personnel management, and financial markets.

According to its editors, Stanley J. Kloc and Joan Vannorsdall Schroeder, the 304-page *Bibliography* offers potential users two distinct advantages: a large number of listings, such as working papers, not available in more traditional indexes; and an efficient subject classification system which was adapted from the American Economic Association's *Journal of Economic Literature*. In addition to subject categorization, the *Bibliography's* listings are also arranged by institution and author.

Each year, the *Bibliography* is distributed to nearly 500 colleges and universities across the United States and internationally. In addition, more than 200 business firms and government agencies regularly order copies of the book.

The *AUBER Bibliography: 1979 Publications* is available from the University Bookstore, West Virginia University, Morgantown, WV 26506. Price is $12.50 per copy.

Limited quantities of the *Bibliography* for previous years are available as well. Once again, past issues are also obtainable in microfilm from Microforms International Marketing Corporation, Elmsford, New York.

Evaluating Inquiries on the Employment Application

GEORGE E. STEVENS

Questions asked of prospective employees can inadvertently cost a company thousands of dollars if inquiries are improperly phrased or if the questions themselves do not relate directly to the job. One large company, for example, had to pay an eventual settlement that cost more than $1.5 million because of alleged discriminatory practices in the hiring process. Such problems can come about as a result of failure to update and evaluate interview questions and pre-employment inquiries on the employment application to ensure that the queries were completely without bias.

Definite rules must be observed when companies ask applicants to complete employment applications. Most employers realize that questions related directly to sex, age, race, color, religion, or national origin are forbidden unless they fit a special category known as bona fide occupation qualifications. However, it is the seemingly appropriate questions that can still cause problems for employers. An employer could be sued, for example, if the organization turned down an applicant because of an arrest record. Employers can be, and have been, sued for not hiring a woman because someone decided the working conditions, travel requirements, or hours were not suitable for a female.

Most large organizations and many small ones, gather preliminary information about prospective employees from employment applications and an interview. The broad area of pre-employment inquiries is one of the most common aspects of a firm's personnel selection activities. In the recruitment and selection of personnel, organizations seek out the most qualified people for the positions available, at wage rates commensurate with the duties and responsibilities of the specific job. Conducting these activities without a knowledge of court orders, administrative decisions, and various regulations, is a risky undertaking.

This article briefly summarizes key equal employment opportunity (EEO) laws, describes the impact of EEO laws on selection, reviews the problems of pre-employment inquiries, and gives some specific recommendations for avoiding the risk of legal action. It is *not* an attempt to give specific legal advice, but, on the basis of the opinions of labor lawyers, regulatory agency staff, and EEO specialists, it may assist individuals who are involved in the selection process. In addition, this article is designed to make employers aware that items both on the application form and in the interview itself are subject to the Equal Employment Opportunity Commission's scrutiny.

The past decade has been a time of concern over the legal vulnerability of employment practices and pre-employment inquiries including employment applica-

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Employers need to review their employment applications to ensure that the questions asked are relevant and pertinent.

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tions. In a recent article, Ledvinka and Gatewood[1] noted the many warnings in business periodicals and lists of forbidden questions in the popular press concerning the use of these inquiries to obtain information in the interview setting or on application. Such warnings demonstrate that the courts have become fully involved in almost every aspect of the selection process. No area is more complex or holds more potential for discrimination liability than employee selection procedures. Charges of discrimination have been levied against the full range of procedures, including recruitment, employment testing, and pre-employment inquiries. It is the selection process, however, that has been responsible for more charges of discrimination than any other area of employment practices.

Court decisions and administrative interpretations of existing legislation have made and will continue to make necessary significant alterations in many existing traditional personnel practices.[2] Equal employment opportunity (EEO) laws are in a constant state of change. In the brief period from mid-1978 to mid-1979, several significant developments occurred, the Age Discrimination in Employment Act was amended; the Pregnancy Discrimination Act was passed; four federal agencies jointly issued the *Uniform Guidelines on Employee Selection Procedures*; and, the President mandated the organization of federal civil rights enforcement. The level, scope, and dynamic nature of this activity complicates the already difficult task of total EEO compliance and reinforces the need for personnel specialists and others involved in the selection process to understand what is required and what is prohibited. These individuals must keep abreast of the latest developments and changes in EEO laws and regulations.

SELECTION PROCESS AND THE LAW

Obviously, employee selection is time consuming, difficult, and costly. In addition, most employers must comply with the obligation of equal employment opportunity — an obligation complicated by the myriad of laws, regulations and orders, which include the following:

Title VII of the Civil Rights Act of 1964 forbade employment or membership discrimination by employer, employment agencies, and unions on the basis of race, color, religion, sex, or national origin. It also established the Equal Employment Opportunity Commission.

The Equal Employment Opportunity Act of 1972 amended Title VII to broaden its coverage and give the Commission (EEOC) power to bring enforcement actions in the courts.

The Civil Rights Act of 1866, Section 1981 has been used in actions to redress employment discrimination based on race, alienage, and national origin. Section 1981 does not apply to discrimination based on sex.

The Equal Pay Act of 1963 forbids pay differentials based on sex. It covers all employees who come under the Fair Labor Standards Act, plus executive, administrative, and professional employees as well as outside sales people.

The Age Discrimination in Employment Act bans employment discrimination because of age against anyone at least 40 years old but less than 70.

The Rehabilitation Act of 1973, Section 503, requires employers with government contracts and subcontracts of $2,500 or more to take affirmative action for qualified handicapped individuals. It requires "reasonable accommodation" to the physical and mental limitations of handicapped employees and applicants. *Section 504* covers the employment practices of all recipients of federal financial assistance such as public schools, colleges, universities, and private employers operating under a federal grant.

Executive Order 11246 (as amended by Executive Order 11375) forbids employment discrimination based on race, color, religion, sex, or national origin by first and second-tier government contractors whose contracts exceed $10,000.

Pregnancy Discrimination Act amends Title VII and states that employment discrimination based on pregnancy, childbirth, and related medical conditions is prohibited under Title VII. As interpreted by the EEOC, the amendment requires that "persons affected by pregnancy, childbirth, and related medical conditions be treated the same as persons affected by other disabilities."

While sketches of key laws have been provided above, this list is not exhaustive. People involved in the selection process must be aware of other acts, laws, and regulations such as The National Labor Relations Act, The Civil Rights Act of 1971 (Section 1983), The Vietnam Era Veterans Readjustment Assistance Act, Title VI of the Civil Rights Act of 1964, The General Revenue Sharing Act, and the thirteenth and fourteenth amendments to the U. S. Constitution. In addition, a number of states have state fair employment practice statutes, and many cities have adopted municipal human relations ordinances.

PRE-EMPLOYMENT INQUIRIES

Fair employment practice statutes have been enacted in forty-five states, including Arizona, but coverage and provisions vary widely. For example, some of the states restrict virtually any questions relating to race, religion, sex, and the like, even the most indirect ones. Other states are less restrictive. Some states exempt questions that are asked for EEO record-keeping purposes, while others do not. The best course of action is to seek out information on the specific prohibitions of the particular state in question.

Specifically, Arizonans should be aware of the relevant provisions of the Arizona Civil Rights Act that are designed to prevent discrimination in employment. This act places restrictions on the kinds of inquiries that may be made of an applicant by employers and employment agencies. Applicable state law, however, is *not* designed to restrict the right of employers to seek full information that they consider essential nor to deny employers the right to establish job performance qualifications.

A useful source of information in Arizona is the Arizona Civil Rights Division's publication titled, *Guide to Pre-Employment Inquiries*. Selected items from the guide are shown in Table 1. However, two caveats should be offered. First, the list of questions shown illustrate those often asked by employers. Second, the guide pertains only to inquiries directed to an applicant *prior to employment*. This latter point is particularly important where employers seek proof on applicant's age or citizenship. This information should be obtained when an individual is hired subject to his being able to produce such proof of age, citizenship, or other material facts. (The point of hire is reached once the employer has decided to hire the applicant and has so informed him.)

State fair employment practice agencies are not the only ones who have something to say about pre-employment inquiries. The Equal Employment Opportunity Commission (EEOC) has taken the position that no question posed in a pre-employment interview or on an application form should be discriminatory in nature or application. Nevertheless, many organizations have failed to review their application forms to determine the appropriateness of the questions. This is a major oversight on their part. Furthermore, in its publication *Guidelines on the Employment Selection Process, 1978*, the EEOC stated that employment application forms "have traditionally been instruments for eliminating, at an early state, unsuited or unqualified persons from consideration for employment and often have been used in such a way as to restrict or deny employment opportunities for women and members of minority groups."

The EEOC prohibits the use of all pre-employment inquiries and qualifying factors which disproportionately screen out members of minority groups or members of one sex and are not valid predictors of successful job performance or cannot be justified by business necessity. However, the EEOC cannot forbid an organization from including nonjob-related items on its application form. In other words, no questions are "per se" violations,[3] but the EEOC looks with suspicion on certain types of inquiries — even when there is no intent to discriminate.[4] And, if the EEOC should investigate a charge of discrimination in which pre-employment inquiries are at issue, the burden of proof is on the employer only if the complainant can establish that a particular inquiry has had a substantial disproportionate impact upon the applicant's protected group. Finally, the EEOC is one of four federal agencies which adopted the *1978 Uniform Guidelines on Employee Selection Procedures*.

UNIFORM GUIDELINES

All people involved in the selection process should become familiar with the *1978 Uniform Guidelines on Employee Selection Procedures*. The *Uniform Guidelines* adopt a "bottom line" concept, whereby the government will not require an employer to justify individual steps if the total selection process has no adverse impact. They go on to define *adverse impact* as a selection rate for any racial, ethnic, or sex group which is less than 80 percent of the selection rate of the group with the highest rate.

The guidelines also require records showing whether the total selection process for each job has an adverse impact on females or minorities, and if it does, records are required showing the impact of individual components. Validation studies are required when the total employee selection process has adverse impact on minorities and women and no alternative procedures without adverse impact are available. Where there is adverse impact in these individual components, evidence must show efforts to modify the procedure to eliminate the adverse impact or attempts to find alternative procedures that do not have such an impact.

Assuming an overall selection process for a given job has an adverse impact and an employer decides on validating rather than eliminating or modifying those pro-

TABLE 1

ACCEPTABLE AND UNACCEPTABLE PRE-EMPLOYMENT INQUIRIES

Acceptable Pre-employment Inquiries	*Subject*	*Unacceptable Pre-employment Inquiries*
Applicant's work experience.	*Experience*	Inquiry into military service of any other country.
Applicant's military experience in the armed forces of the U.S., in a state militia (U.S.), or in a particular branch of the U.S. armed forces.		
Have you ever been convicted of any crime? If so, when, where and disposition of case? (Conviction of a crime may not be an absolute bar to employment.)	*Character*	Have you ever been arrested?
Organizations, clubs, professional societies or other associations of which applicant is a member, excluding those which by their name or character indicate the race, color, religion, sex or national origin of its members.	*Organizations*	List all organizations, clubs, societies and lodges to which you belong.
Have you ever worked for this company under a different name?	*Name*	Former name of applicant whose name has been changed by court order or otherwise.
Maiden name of married female applicant, assumed name or change of name, if necessary to check educational or employment records.		
Inquiry into place and length of current and previous addresses.	*Address or Duration of Residence*	Specific inquiry into foreign addresses which would indicate national origin.
	Sex	If not based on a bona fide occupational qualification. (It is extremely difficult for "sex" to be considered a lawful pre-employment inquiry.)
Requirement that applicant submit a birth certificate or other proof of legal residency after employment.	*Birthplace*	Birthplace of applicant, applicant's parents, spouse or other relatives; requirement that applicant submit birth certificate, naturalization or baptismal record.
Requirement that applicant submit a birth certificate or other document, after employment, as proof of age.	*Age*	Requirement that applicant produce proof of age in the form of a birth certificate, baptismal record, or Employment Certificate or Certificate of Age issued by school authorities.
Request applicant to state the status of his/her residency. (a) Citizen of U.S. (b) Legal right to remain permanently in the U.S. Statement by employer that, if hired, applicant may be required to submit proof of citizenship.	*Citizenship*	Of what country are you a citizen? Inquiry whether an applicant or parents or spouse are naturalized or native born U.S. Citizens; the date when the applicant or parents or spouse acquired citizenship; requirement that applicant produce naturalization papers or first papers.
Inquiry into the academic, vocational or professional education of an applicant and the schools he/she has attended.	*Education*	Any inquiry asking specifically the nationality, racial or religious affiliation of a school.

*These inquiries are considered unacceptable unless the employer can prove they are valid predictors of job success.

Source: Examples taken from *Guide to Pre-Employment Inquiries Under the Arizona Civil Rights Act.* (Phoenix, Arizona: Arizona Civil Rights Division, 1977). The Guide is intended for general information only. It does not carry the force of legal opinion.

cedures with the adverse impact, then compliance with the guidelines requires the employer to —

> first, maintain evidence (a validation study) showing the validity of each component that has an adverse impact. This evidence must be in terms of criterion-related validity, content validity, construct validity, or evidence from other studies demonstrating the validity of the procedure.[5] The employer must also prepare, or have prepared, a report on each validation study so that an evaluation of validity can be made. Location and dates of the study, job analysis or review of job information, techniques and results of the study, and the relationship between the procedure and job performance are the kinds of information required for such reports.

These procedures apply not only to tests but to all selection procedures used as a basis for any employment decision, such as hiring or promotion. Questions and answers concerning the guidelines and a more detailed explanation of these guidelines may be found in *Analysis of Uniform Guidelines on Employee Selection Procedures*.[6]

In addition to the guidelines and relevant equal employment opportunity laws, the employer must be knowledgeable about rapidly evolving case law and critical court decisions. In particular, employers should realize that the guidelines are not the final word. For example, several recent Supreme Court decisions have not been in accord with these guidelines.[7] Listed in Table 2 are some important court decisions in unfair discrimination. All of these are U.S. Supreme Court decisions.

A useful guide to recent judicial decisions made by the circuit courts and Supreme Court is *Equal Employment Opportunity Court Cases*.[8] This government publication provides facts, key issues and discussion of suits brought under provisions of the United States Constitution and the various civil rights statutes. In addition, several important source materials cover the legal matters in employment discrimination. One such source is the Commerce Clearing House Publication[9] of *Employment Practices Decisions*, which discusses various court decisions. An excellent source is the Bureau of National Affairs[10] which publishes the texts of state and federal laws along with explanations of these laws, texts of the governmental directives and agencies' guidelines, and a case law book, *Fair Employment Practices*. These latter materials, which are updated every two weeks, include full texts and opinions of federal and state court rulings pertaining to employment discrimination.

PRECAUTIONS

In the face of the increasingly complex legal restrictions regarding employee selection, one might ask if there are any precautions to guarantee that an employer will stay out of trouble with pre-employment inquiries. Unfortunately, there is always an element of legal risk so there can be no such guarantees. The following steps,

TABLE 2

IMPORTANT COURT DECISIONS IN UNFAIR DISCRIMINATION

Date	*Case*	*Relevant Aspects of Decision*
1971	Griggs v. Duke Power	Once adverse impact is established, organizations must demonstrate that selection practice is valid.
1975	Albemarle v. Moody	Validation study shown to be "materially deficient" when compared to EEOC guidelines on testing.
1976	Washington v. Davis	When test challenged under constitutional law, intent to discriminate must be established. Validation study upheld.
1977	Dothard v. Rawlinson	Height requirements were not valid and therefore illegal. Reinforced role of statistics in establishing adverse impact under Title VII cases.
1977	Trans World Airlines v. Hardison	"Reasonable Accommodations" need not require organizations to violate union and seniority systems in order to accommodate religious observances.
1978	Bakke v. Regents of the University of California	Reverse discrimination not allowed; Bakke must be admitted to medical school. Race may be taken into account as an element to be considered in selection decisions. Affirmative action programs permissible when prior discrimination has been demonstrated.

Source: Richard D. Arvey, *Fairness in Selecting Employees*, p. 224.

however, can make the selection process in general, and pre-employment inquiries in particular, more defensible.[3]

•Pinpoint any question that might possibly tend to identify an applicant as a member of a protected group or disqualify or disfavor an applicant of a protected group. Such questions are problem questions.

•Decide whether there is sufficient justification for such questions. Are they related to the jobs being applied for? Are the questions legally defensible?

•When questionable inquiries must be made, indicate on the application form that they will not be used to discriminate. (Applications frequently include a footnote that age questions will not be used to discriminate against any applicant.)

•Consider a two-phase inquiry: pre-hiring and post-hiring. Some information is not needed to make the hiring decision and can wait until the applicant is hired. Much of this information (e.g., age, sex, marital status) when asked *before* hiring is suspect.

•Keep a separate file of race, sex, and handicapped status information needed for EEO record keeping. Although such information can be collected before hiring in most states, be sure that it is *not* coded on the applicant form.

•Try to minimize subjectivity and intuitive judgments that cannot be defended on the basis of a relationship to job performance. Be explicit in stating the relative importance of information, and make decision rules clear.

•Conduct valid research in an attempt to substantiate those employment application questions which the organization deems necessary for the proper operation of the business or which it believes can be substantiated as bona fide occupational qualifications (BFOQ). Some examples of BFOQ exceptions are the Federal Aviation Agency regulation setting a ceiling age for pilots, and sex as a BFOQ in the hiring of a men's room attendant.

Several steps have been mentioned that might help employers make their application forms court proof. One basic step remains. In some cases, a simple alteration of a question presently asked may minimize the legal risk. In Table 3 several inappropriate pre-employment inquiries are identified. The inquiries are rephrased to be more appropriate.

TABLE 3

SELECTED INAPPROPRIATE QUESTIONS AND RECOMMENDED SUBSTITUTIONS

Inappropriate Questions	*More Appropriate Questions*
1. Do you have any physical defects?	1. Do you have any physical defects, or impediments which might, in any way, hinder your ability to perform the job for which you have applied?
2. Have you had any recent, or past illness or operations?	2. Have you had any recent or past illness or operations which might, in any way, hinder your ability to perform the job for which you have applied?
3. What was the date of your last physical exam?	3. Are you willing to take a physical exam at our expense if the nature of the job requires one?
4. Are you a U.S. Citizen?	4. Do you have the legal right to live and work in the U.S.?
5. Date of Birth?	5. Are you over 18 and less than 70?
6. Age?	6. Are you over 18 and less than 70?
7. Emergency Information: (Relationship)?	7. Emergency Information: Name, Address, Telephone No.
8. Do you possess a legal driver's license?	8. Only for applicants who desire a job driving a company vehicle: Do you possess a legal and current driver's license?
9. What are your hobbies? Interests?	9. Do you have any hobbies or interests which have a direct bearing on the job you are seeking?
10. Have you ever been convicted of a misdemeanor or felony?	10. Have you, since the age of 18, ever been convicted of a misdemeanor or felony? (Note: A conviction will not necessarily bar you from employment. Each conviction will be judged on its own merits with respect to time, circumstances and seriousness).
11. Dates attended High School? Grammar School?	11. Did you complete Grammar School? High School?
12. Date graduated or last attended High School? Grammar School?	12. Same as item 11.
13. In what extra-curricular activities did you participate? Clubs?	13. While in school, did you participate in any activities, or belong to any clubs, which have a direct bearing upon the job for which you are applying?
14. College subjects of interest?	14. While in college, did you take any courses that directly relate to the job for which you are applying?

Source: E.C. Miller, *Personnel Administrator*, March 1980, p. 68.

CONCLUSION

This article has attempted to make Arizona business people and others aware of the dramatic and rapidly evolving federal and state statutes, judicial decisions and EEO regulations which affect the employee selection process. In particular, people should realize how vulnerable both the interview and the employment application are to enforcement agencies' scrutiny. In addition, some suggestions have been offered that will help an employer "court proof" his employment application. Finally, a number of references have been provided so that personnel professionals and others involved in selection may keep abreast of the laws.

It is in the best interest of the organization to carefully review its own application forms to determine the appropriateness of the pre-employment inquiries. Before including any inquiries on an employment application form the employer should know whether the question is in conflict with the guidelines or court decisions, whether the question is in conflict with the spirit and intent of the Civil Rights Act and other statutes, and whether the question really has anything to do with the job the applicant is seeking. Another important aspect to consider is whether the mere inquiry constitutes an invasion of the applicant's privacy. These and similar issues must be considered. The best approach is to work to eliminate or alter any employment application question which might make the employer vulnerable to charges of unfair discrimination[11] and the attendant expensive and time-consuming legal proceedings.

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[1]For a more detailed discussion of key EEO laws, see W. P. Murphy, J. G. Getman, and J. E. Jones, *Discrimination in Employment* (4th Ed.), J. E. Jones, *Reference Supplement-Discrimination in Employment*, (Washington, D.C.: The Bureau of National Affairs, 1979).

[2]See W. H. Holley and H. S. Field, "Equal Employment Opportunity and Its Implications for Personnel Practices." *Labor Law Journal*, Vol. 27, No. 5, 1976, pp. 278-286, for a discussion of EEO's impact on personnel practices.

[3]J. Ledvinka and R. D. Gatewood, "EEO Issues with Pre-Employment Inquiries," *Personnel Administrator*, February, 1977, pp. 22-26.

[4]E. C. Miller, "An EEO Examination of Employment Applications," *The Personnel Administrator*. March, 1980, p. 64, states that there is a single "forbidden" item — any inquiry on arrest records.

[5]The three specified types of validity may be defined as follows: 1. Criterion-related validity — showing that those who score high on a particular test or selection standard usually turn out to be successful on the job, and those who score low are usually unsuccessful; 2. Construct validity — showing that a test or selection standard measures some characteristic that is clearly needed for the job; and 3. Content validity — showing that a test is an actual sample of the work to be done.

[6]M. G. Miner and J. B. Miner, *Analysis of Uniform Guidelines on Employee Selection Procedures*, (Washington, D.C.: The Bureau of National Affairs, 1979).

[7]See R. D. Arvey, *Fairness in Selecting Employees* (Reading MA: Addison-Wesley, 1979) pp. 223-240 for a discussion of key court decisions in unfair discrimination, recent developments and trends.

[8]*Equal Employment Opportunity Court Cases* (Washington, D.C.: U.S. Office of Personnel Management, Office of Intergovernmental Personnel Programs, 1979).

[9]Commerce Clearing House Publication (4025 W. Petersen Ave., Chicago, IL).

[10]Bureau of National Affairs, Inc. (1231 25th St., N.W. Washington, D.C.).

[11]The basic objective in selection is *to discriminate*; that is, to provide a means by which to select some people and reject others. Unfair discrimination or bias is said to exist when members of a minority group have lower probabilities of being selected for a job when, in fact, if they had been selected, their probabilities of performing successfully in a job would have been equal to those of nonminority group members.

Subscription Television and its Effect on the Movie Industry

RICHARD F. BELTRAMINI
JANET BREITENBUCHER

The two main forms of mass visual entertainment in the United States are television and motion pictures. Both industries are in the process of change, but while the changes in television are mainly technological, the changes in the film industry are primarily financial and organizational and result in part from the impact of television.

The two media are basically competitors for the entertainment attention of the American public. The development of subscription television, however, has accentuated this competition, and the motion picture industry is being forced into diversification and reorganization of management and marketing.

This article describes some of the trends in subscription television and analyzes some organizational and financial problems in the motion picture industry. The effects of the television trends are then discussed with respect to the future of the motion picture industry.

While subscription television is expanding rapidly, the motion picture industry is experiencing a variety of financial and organizational problems. The movie industry is responding to the competition by innovation and diversification.

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TELEVISION TECHNOLOGY

The communications industry is working hard to make the television set a medium for home entertainment that is affordable for almost everyone. It is no longer a medium marketed only to mass audiences, but it is taking on new directions that will appeal to various segments of viewers.

Technology is increasing, and the television set is quickly becoming a versatile part of everyday existence. A videocassette player/recorder can tape a program and play it back when desired. Commercials can be erased while shows are being recorded. Videodisk players can play prerecorded programs through the television set. Several movie companies have put some of their films on videotape, which can be rented or purchased for use at home. New brands of television sets can be programmed in advance to switch to certain channels at the programmed time (so the viewer will not have to change channels), to turn lights on and off, or to answer the telephone. A Japanese manufacturer recently demonstrated a television set that can be controlled by talking to it.

An individual can have a theater at home with a choice of television sets that have screens as small as 1½ inches diagonally or projection models with screens as large as 25 feet. With some guidance from *Popular Mechanics* an individual can build a big-screen television set for less than $500. Kits are also available that

will help turn a 13-inch color TV into the heart of a one-piece projection TV.

A look into the future may see television stations broadcasting in stereo and televisions linked to computer data banks via telephone lines. For example, an experiment in Coral Gables, Florida, is being conducted this summer in 150 homes to test this concept.

TRENDS IN SUBSCRIPTION TELEVISION

When the Federal Communications Commission (FCC) dropped its limit on the number of signals from distant television stations that cable systems were permitted to receive and transmit, the cable television industry began rapid growth. Just recently the FCC freed cable TV from most of the last remaining government regulations. Now cable companies can carry as many channels as they choose, where previously they were limited to transmitting the programs of just a few stations outside their franchise areas. Companies no longer have to black out syndicated programs, even if the local over-the-air stations have paid for exclusive rights. A few limitations remain, however. Cable TV cannot transmit regional sports events that over-the-air stations in the area had to black out; and cable TV cannot air a national network production on one of the extra cable channels at the same time a local network affiliate is showing it.

Cable television, currently reaching 20 percent of the country's 73 million households, is predicting 30 percent saturation by late 1981. Increasing at a compound annual rate of 7.4 percent, the number of subscribers may approach 20 million by 1983 (see Table 1).

TABLE 1

CABLE TELEVISION OPERATION SYSTEMS AND SUBSCRIBERS

Year	*Operating Systems*	*Total Subscribers*	*Percent of TV Households*
1978	4,030	12,900,000	17.7
1977	3,801	11,900,000	16.7
1975	3,450	10,800,000	15.5
1974	3,158	8,700,000	13.0
1973	2,991	7,300,000	11.1
1972	2,655	6,000,000	9.6
1971	2,570	5,300,000	8.7
1970	2,490	4,500,000	7.6
1965	1,325	1,275,000	2.4
1960	640	650,000	1.4

Note: Data for 1976 is not available.
Source: International Television Almanac, 1979, p. 144.

The cable industry sees its future in the additional revenue from subscription television. Basic cable service costs approximately $7 to $10 per month for up to 36 channels, although a system is currently being proposed for receiving as many as 120 channels. For an additional charge of $8 to $10 a subscriber can get commercial-free, unedited movies and sporting events from various companies.

Programming is chiefly distributed nationally by satellite. Signals are received at earth stations and retransmitted to area cable systems. Signals are also distributed through some type of microwave transmission networks as regular cable TV.

The major suppliers of subscription television are Home Box Office, a subsidiary of Time, Inc.; and Showtime, a joint venture of TelePrompter and Viacom International. Time's Home Box Office serves approximately 2 million households nationwide, while Showtime serves about 600,000 (see Table 2).

Basic subscriber revenues, not including program subscription fees or income from advertising or other services, were estimated to have reached $1.5 billion in 1979, a 21 percent increase from 1978 (see Figure I). A 16 percent increase is forecast for 1980 to $1.69 billion, and $2.3 billion by 1983, with revenues from subscription television adding about $850 million.[1]

In May, 1979, the FCC Chairman, Charles Ferris advised the cable industry to offer marketable, diversified programming if it intends to survive in an increasingly competitive environment. He recommended the delivery of diversified and specialized services that reflect the needs of all of the viewers.[2] Whereas the television industry in the past was encouraged by Washington to offer programs that appealed to the mass audience, narrowcasting has been the approach of cable TV. Cable executives say most programs will be geared to the interests of specific audience segments, creating a "big audience by combining a lot of little audiences."[3]

Marketing Techniques of Subscription Television

Marketing techniques of subscription television are being continually reevaluated and redesigned as marketers become increasingly sophisticated in this new industry. Cablevision is marketing its service by offering a number of different program packages for varying prices. In January of this year Chicago received its first taste of cable television. Cablevision's program at that time included Home Box Office or Showtime, two of its own movie packages (Action Plus and Weekend Cin-

ema) and its own sports package. To facilitate the marketing of these services, Cablevision used the Oak Total Control Scrambler system that links set-top converters to a central computer that can turn on or off any service in any home.[4]

ON-TV in 1979 chose to spend approximately $2,000,000 a year on promotion, advertising and marketing. Fast growth is the objective, with the ever increasing competition from subscription television companies. Executives are hoping to keep a wide spectrum of programming, repeating movies an average of six times over a three-month period rather than ten times or more, as other systems do.[5]

Home Theater Network (HTN) is attempting to create a particular image as a quality, family movie channel offering G and PG movies and running advertisements directed toward this target audience. The distinctive movie frame border and a new format in scheduling — the Double Premiere Week — are methods being used to position HTN in the subscription television market. In the regular schedule HTN features one film each week, premiering it on three nights and bringing it back two weeks later on Friday night. Double Premiere Week offers one movie that plays Monday and Tuesday and is brought back two weeks later on Friday night; the second movie premieres Wednesday and Thursday nights, and returns two weeks later on Saturday night. Promoters are running spots up to three minutes each, occasionally before the movie begins, to inform customers of schedules, how films are selected and how to obtain the most value from HTN's service.[6]

HBO's central theme in marketing is "HBO people don't miss out." Jim Heyworth, new president of the company, believes the future is bright for his company and his industry. He sees the necessity of remaining in touch with his audience and the cable television mix they want, in order for growth of the network to continue. A new priority in 1981 will be to develop additional services and to increase the national awareness of HBO.[7]

The programming umbrella concept is being used by Jim Miller, director of Showtime's program administration. The system places many of Showtime's movies and original productions under recognizable umbrella titles or categories such as classic films, fast-moving action/adventure or romance, after-hours programs,

TABLE 2

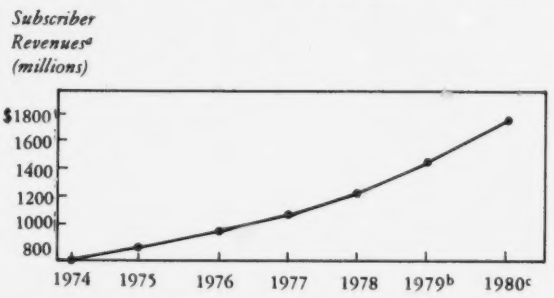
SUBSCRIBERS AND MARKET SHARE OF SUBSCRIPTION TELEVISION

Distributor/Booker	*Number of Subscribers*		*Percentage Share of Market*	
	June, 1979	*December, 1979*	*June, 1979*	*December, 1979*
Home Box Office	2,889,100	4,007,432	6.02	62.5
Showtime	719,699	963,615	15.0	15.0
National STV (Perenchio)	179,639	269,056	3.8	4.2
Telemation PGM Services	303,103	264,849	6.3	4.1
Self-booked Systems	181,080	260,053	3 8	4.1
Movie Channel (Warner)	143,716	186,835	3.0	2.9
Hollywood Home Theatre	202,081	170,887	4.2	2.7
Wometco Home Theatre	52,129	73,457	1.1	1.2
VU-TV (Formerly Best Vision)	35,143	66,031	0.7	1.0
American STV	25,000	37,500	0.5	0.6
Home Theatre Network	16,205	35,727	0.3	0.6
Starcase	—	33,200	—	0.5
Optical Systems	25,938	23,962	0.7.	0.4
Pay TV Services	22,908	8,817	0.3	0.1
Cinemerica	5,511	5,040	0.1	0.1
Galavision	—	2,004	—	—
TOTAL	4,801,487	6,408,465	100.0	100.0

Source: Paul Kagen Association, Inc.; *The Pay TV Newsletter,* April 11, 1980, p.2.

FIGURE 1

CABLE TELEVISION SUBSCRIBER REVENUES



[a]Estimated basic subscriber revenues only. Does not include program subscription fees, or income from advertising or other services.
[b]Estimated
[c]Forecast

Source: Federal Communications Commission. Estimates and forecasts by Industry and Trade Administration (BDBD).

and family theater. The objective is to develop a clear idea of the programming Showtime has to offer. Showtime is also emphasizing major movie titles, with at least one major title offered every month.[8]

Television Viewing Time Is Increasing

Increasing technology in the television industry and the growth trend in the cable industry are making the home a video center all its own.

Nielsen's studies in 1959 revealed that the average television viewing, per home per day, totaled four hours and 58 minutes. In 1979 the average television family watched six hours and forty-five minutes of television every day (see Table 3).

TABLE 3

HOUSEHOLDS WITH TELEVISION SETS
1950-1979

Year	*Total Households (thousands)*	*Households With TV Sets (thousands)*	*Percentage of Total*	*Average Viewing Per Day (hours)*
1950	43,000	3,880	9.0	4.6
1955	47,620	30,700	64.5	4.9
1960	52,500	45,750	87.1	5.1
1965	56,900	52,700	92.6	5.5
1970	61,410	58,500	95.3	5.9
1975	70,520	68,500	97.1	6.1
1976	71,460	69,600	97.4	6.3
1977	73,100	71,200	97.4	6.2
1978	74,700	72,900	97.6	(NA)
1979	76,240	74,500	97.7	6.3

Source: Statistical Abstract of the United States, 100th Edition, p. 587.

In December, 1979, a Nielsen report — Nielsen's first on national pay cable audiences — placed cable fourth in prime time viewing, behind the three commercial networks. David Harkness, Nielsen business development marketing manager, told a subscription television seminar that "subscribers to pay TV are not necessarily dissatisfied with commercial TV. On the contrary, they enjoy television so much, they want more."[9]

Esquire magazine conducted a survey of videocassette recorder owners. Out of 4,100 names taken from warranty cards, 2,497 replies were received. The results indicated that current movies were first choice for viewing, movie classics second, sporting events third, situation comedies fourth, and documentaries, public affairs and adult education programs fifth.[10]

CABLE TV IN PHOENIX

Microwave subscription television in Phoenix began with 200 homes in the early part of 1978, progressed to 2,300 homes by October, 1978, and currently serves approximately 23,000 homes, according to Thomas Crosby, president of American Cable Television. Cable subscription television today includes 8,500 total hookups in 4,102 homes. Crosby projects an increase of 4,000 per month until June, 1981, and then an increase of 6,000 per month through the end of 1982.

American Cable Television (ACT) recently reached an agreement with Times-Mirror Cable Television in which Times-Mirror has purchased a 20 percent interest in ACT.[11] In June, the Phoenix City Council ruled 4 to 3 to issue additional citywide licenses to two competitors, Storer's Camelback Cablevision and New Jersey-based Cross Country Cable. A third license was granted to Western Cable, a new firm wiring a small 14 square mile portion of northeast Phoenix.

ACT's license was granted four years ago, but it became operational this July. Construction was started in January, and so far ACT has wired approximately 500 miles of Phoenix. The funds ACT is receiving from Times-Mirror will be used to finish wiring the city.

Storer's Camelback Cablevision expects to spend $94 million in wiring the whole city, and has begun construction of a forty-four channel system in south Phoenix. Cross Country feels it will take at least $60 million to wire the entire area, and hopes to install a fifty-two channel system.

TRENDS IN THE MOVIE INDUSTRY

While the subscription television industry seems to be thriving, the movie industry is subject to some factors that could influence its future health. According to *Variety*, the total United States summer box office receipts in 1980 totaled approximately $940 million, a drop of nearly 2 percent from summer, 1979. The overall ticket inflation rate for the summer period of this year was approximately 6½ percent. Thus, the real box office drop this year was in the range of 8 percent.[12]

Expenses are also increasing rapidly. Costs for union production personnel have risen. Production costs alone for 1979 were up 200 percent per major movie studio over the last seven years. Expenses for studio overhead and maintaining a distribution system have also contributed to the cost of films.

Although 1979 domestic box office revenues were expected to rise 7.4 percent, the increase was entirely

due to higher ticket prices which have gone up 8 percent. Comparisons for the first six months of 1979 against the same period in 1978 show an increase in domestic revenues of 4.8 percent, but attendance dropped an estimated 3 percent. In 1978, box-office gross climbed almost 12 percent to $2.653 billion, from $2.372 billion. The gain was a reflection of increased admissions and higher ticket prices (see Table 4).

TABLE 4

*PERFORMANCE OF FILM PRODUCERS IN 1978

	Revenues (Millions$)		*[1]Income (Millions$)*	
	1978	*1977*	*1978*	*1977*
Universal (MCA, Inc.)	724.4	561.4	159.8	107.4
Columbia Pictures	437.0	298.3	80.1	30.8
Twentieth Century-Fox	408.0	369.4	91.9	69.7
Warner Communications	393.0	353.2	79.9	58.0
Paramount (Gulf & Western)	384.0	232.0	N.A.	N.A.
United Artists (Transamerica)	370.0	378.2	55.6	60.2
Metro-Goldwyn-Mayer	182.6	139.2	39.0	26.6
Walt Disney Productions	152.1	118.1	54.1	46.1

*Includes movies and television.
[1]Before taxes and unallocated corporate expenses.

Source: Standard & Poors Industry Surveys, April, 1980, p. L28.

Theater admissions reached 1,133 million during 1978, surpassing 1977 by almost 7 percent. It was the highest number of admissions since 1961, when attendance was 1,225 million.[12] For the first three months of 1980, the Motion Picture Association of America reported that attendance was down 2.5 percent with 264.8 million people attending compared to 271.6 million in 1979.[14] Theater attendance in the United States has increased less than 20 percent during the past ten years.

Blind Bidding

Besides rising costs and declining attendance, another major concern of movie studios is the drive by exhibitors to outlaw blind bidding. In blind bidding, theater owners receive a summary which describes the plot of a movie and lists the stars and the director. With this information they bid on a movie without ever having seen the film and agree to play the movie a specified number of weeks. In some instances a theater owner offers a cash guarantee, which may result in a loss if the movie turns out to be unsuccessful and the theater owner has agreed to run it for a period of time. Approximately 75 percent of all major films are bid in this manner.

The movie companies, on the other hand, need blind bidding. It is necessary because of huge production and advertising costs. Without blind bidding, release dates of films would be delayed and interest expense incurred on borrowed money would mount up. Movie companies would be less inclined to [illegible] great deal of money into a film if they were not [illegible]d of showing dates in theaters. They would probab[illegible]e less willing to be creative on artistic or experimental films. Ticket prices on successful films would skyrocket. Theater owners claim they may be forced into bankruptcy unless blind bidding is prohibited. They feel they will need to raise their ticket prices to make up some of the losses.

The issue of blind bidding is presently being debated in the state legislatures. Approximately fifteen states have passed legislation forbidding blind bidding.[15] If more states pass legislation to protect theater owners, the risk will be shifted back to the studios.

Theater Growth

In 1978, there were an estimated 12,275 theaters in the United States, 20 percent of all theaters having more than one screen. Between 1976 and 1978 the total number of theaters declined 1 percent, but the number of screens increased 8 percent. The most recent figures available from the National Association of Theater Owners reveal that in July, 1979, there were 16,965 screens in operation.

The trend today is toward four and six auditorium complexes. Indoor construction today consists of auditoriums seating 350 to 500 in multiple complexes. The goal is to completely sell out one auditorium and pick up an overflow into adjoining satellite auditoriums. People who want to see a specific film will probably come back; meanwhile they may have bought refreshments and may have seen another show.

Interest rates are high and obtaining financing for

construction may be difficult as banks generally avoid financing one-purpose buildings. As a result, theater owners may have a difficult time building new structures. With the possibility of the economy getting worse rather than better, theater owners may have to think about alternate uses for the theater and should incorporate appropriate facilities during the design phase of their building.

As the population shifts to the suburbs, most theater companies are considering shopping centers as prime locations. This usually involves leasing facilities, which frees the theater owner's working capital for improvements and future acquisitions.[16]

HOW SUBSCRIPTION TELEVISION TRENDS AFFECT THE MOVIE INDUSTRY

For the motion picture industry as a whole, subscription television developments provide both good and bad news. For expanded distribution of films by the major movie studios, the news is good. By 1985 the cable industry predicts the number of subscribers will reach 35.6 million. John F. Berry, publisher of *Box Office*, feels the demand for programming will continue to grow as the cable industry grows, with movies being the main source of entertainment.

However, competition for the entertainment dollar will increase as more communities become serviced. Berry believes aggressive marketing, and the increased availability of first run movies to the American family via cable, pose a growing threat to theater owners.[17]

Film companies earn revenue not only from film rentals, but also from cable, cassette, and disc earnings. Opinions within the movie industry indicate that diversification of the studios into other areas has made the industry more stable, and less dependent on the blockbuster movie to ensure a good year.

While after-markets such as network television, syndication, pay television, and video cassettes and discs provide potential sources of new income, the industry holds that the success of a film in theatrical distribution creates the demand for all the other ancillary markets. The consensus seems to be that the prime objective of the movie industry must remain the production of theatrical films. But as film budgets increase and admissions drop, the question is, Will there be enough money from the ancillary business to cover costs?

With rising costs of theater tickets, gasoline, babysitters, parking, compounded by the availability of good movies at home on subscription television, people may be more inclined to stay at home. Others feel the lure of an evening out will always be there.

Michael Fuchs, programming vice-president of HBO, said recently of the impact of subscription television on the movie industry, "Tens of millions of dollars have been committed by HBO to prebuys of more than 100 films." These films are to run over the next five years. Seemingly preproduction commitments such as these will help the movie industry by providing larger budgets than they would normally have available via traditional distribution. Fuchs cited figures that showed 40 percent of Americans never or almost never go to the movies, and HBO is picking up substantial numbers of that audience. He assured theater operators that they would be the first to receive feature films, however, which he feels is essential to the marketing of subscription television.[18]

The motion picture theater can supply entertainment unequaled in a home. The home video that imitates the theater experience is affordable only to upper income families at this point in time. George H. Wead and Thomas G. Schatz, assistant professors of radio-television film at The University of Texas at Austin, explored the future of motion pictures with distinguished film director, Edward Dmytryk.[19] Based on their work, Wead stated that movies still provide what television will never provide — the big image, the great experience. Spectacular films such as "Jaws," "Star Wars," and "Close Encounters" fare best at the box office. Part of the appeal of movies may come from a psychological demand for shared public images, theorized Wead. Thus, home movies may never substitute for the movie theater experience.

THE FUTURE

In order to respond to the competition of expanding television technology and the new growth of subscription television, movie industries seem to be placing emphasis on the reorganization of management and marketing, and concentrating on income growth in other areas.

Walt Disney Productions recently put together a new management structure to create and develop new programs and projects. Several new divisions were formed such as: Walt Disney Motion Picture and Television Production; Walt Disney Outdoor Recreation Division; and Walt Disney Marketing Division.[20] Last year about 60 percent of Disney's total income was derived from outdoor recreation such as Disneyland, while only 20 percent came from motion pictures.[21]

Metro-Goldwyn-Mayer (MGM) has just split into two entities, MGM Filmco and MGM Grand Hotels,

Inc. Filmco will soon be announcing its entry into the fields of videodisc and videocassette, and plans to release twelve to fifteen pictures per year with the possibility of increasing production beyond that. Frank E. Rosenfelt, chairman and chief executive officer of MGM Filmco, intends to expand their series and movie-of-the-week activities, "We intend to become a major contributing force within the industry," he said.[22]

Craig Miller of Lucasfilm Ltd. claims a marketing approach that encourages fanaticism. He makes science fiction films popular by an advertising medium called "compulsion of mouth," whereby you feel inferior if you have not seen the film. When the movie is over he sees to it that the compulsion lingers by letting fans know what their stars are doing, by assembling and performing promotional presentations, and by fan clubs. Fan clubs maintain interest in the movies and bring viewers back to see the show another time. Miller believes studios need to be more aware of the public.[23]

At the end of 1978 Paramount had been successful with a string of twenty profitable movies in a row. Convinced that marketing of movies was too standardized, Paramount localized its promotions by hiring local advertising agencies. It tailored its marketing program to fit the audience at which the movie was targeted. "Saturday Night Fever," for example, was promoted through music. Brochures on the film were prepared to accompany sound-track albums that were sent to radio stations and read to teenage audiences by the disc jockeys. Wider releases of films have become the rule, rather than the exception.[24]

Alan J. Hirschfield, vice-chairman of 20th Century-Fox, told the Academy of Television Arts and Sciences recently that it is "unlikely theatrical revenues will grow" in the future, and that "it's clear the FCC is using cable as the ultimate weapon to control the networks."[25] According to Hirschfield, 36 million homes have cable now, 57 million will have cable in 1985, and 70 million in 1990. Approximately 70 percent of these cable homes also subscribe to pay television.

Hirschfield protested the fact that movie studios cannot own cable systems, which severely limits their abilities to capitalize on the home video market. He expects this market to grow to 10 million units by 1985. He continued that the industry "must be allowed to compete freely" or history proves "we're going to be left behind."[26]

As he explained, the average cost of movie features today is in excess of $8.5 million, plus $6.5 million in marketing expenses. This means that movie companies have to attract box-office audiences of 12 or 13 million merely to "get our money back." According to Hirschfield, about 20 percent of the gross revenues from these movies shown on subscription television go to the movie companies, while the middlemen (HBO and Showtime) receive about 30 percent, with the remaining 50 percent going to hardware system owners.

SUMMARY

As television technology has become more advanced, new options are offered to the American movie viewer. FCC rulings and aggressive marketing by the cable companies have helped subscription television grow, posing new competition for the movie industry. Attendance in movie theaters is down. Blind bidding has received a negative ruling in fifteen states, posing financial problems for the movie industry.

As subscription television grows, so does competition for the entertainment dollar. The movie industry is responding by diversification. Ancillary markets offer new sources of revenue that are sharing some of the financial burdens of the industry. However, the movie industry faces high costs, and it is questionable whether diversification can cover the increasing costs of film production. Technical versus human processes that affect productivity in production, distribution, and exhibition levels must improve in order to restore a more cost-effective industry.

Management reorganization and new marketing techniques, along with new technologies, may partially remedy the ailing movie industry. New management structures, product diversification, and regional marketing communications programs have been relatively successful thus far. However, the challenge remains to harness technology innovatively and to market an entertainment experience not possible within the home, if the movie industry's future is to parallel that of subscription television.[27]

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[1]*U. S. Industrial Outlook 1980*, p. 443.

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Issues in Public Utility Regulation

DENNIS T. OFFICER

One of the most complex economic and political issues confronting consumers, investors, and regulatory agencies is how to balance the interests of consumers and investors in regulating public utilities. The main issue is that regulatory agencies must allow a rate of return on the utility's investment that produces enough revenue to ensure the financial integrity of the utility; at the same time the agencies must set prices on the utility's product or service that do not result in a monopoly profit paid for by the consumer.

Thus, if a regulatory body allows too low a rate of return, consumers pay less for the utility service at the expense of utility investors who may abandon the utility for other more attractive investments. Conversely, a rate of return that is too high will mean utility investors are earning monopoly profits at the expense of the rate-paying public.

The purposes of this article are first, to examine the legal and economic justification for the regulatory process as it applies to electric, gas and telephone utilities; second, to demonstrate an example of utility regulation and some of the areas of conflict in regulation; and, finally, to show how modern financial theory used in conjunction with diligent and thoughtful regulation is in the best interests of consumers *and* investors.

Public utilities must be allowed to charge a rate that will assure the stockholder a fair and reasonable rate of return, but will not penalize the consumer. This article discusses the problems involved for the regulating agency in determining that rate.

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LEGAL AND ECONOMIC JUSTIFICATION FOR UTILITY RATE REGULATION

Utility regulation occurs at several levels of government. At the federal level, the two principal regulatory agencies are the Federal Energy Regulating Commission (FERC) and the Federal Communications Commission (FCC). Both are responsible for regulating public utilities engaged in interstate commerce. Furthermore, each state has some form of a public utilities commission. In Arizona, the Arizona Corporation Commission, through the Utilities Division, serves as the major state regulatory agency.

The legal authority and justification for regulating the rates of return utilities may earn on their investment emanate primarily from two U.S. Supreme Court decisions: *Bluefield Water Works and Investment Company v. Public Service Commission of the State of West Virginia* (262 U.S. 679, 1923) and *Federal Power Commission v. Hope Natural Gas Company* (320 U.S. 591, 1944). The cases are hereafter referred to as the *Bluefield* and *Hope* cases.

Both decisions attempted to clarify the legal standard for determining "fair and reasonable" rates of

return a utility was allowed to earn. A just and reasonable return was defined in *Bluefield* as:

> . . . a return on the value of property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties.[1]

Bluefield clearly set the standard of comparison in rate of return regulation as that rate of return earned by "other business undertakings."

The *Hope* case went further to recognize the need for a utility's revenue to cover "capital costs" in addition to operating costs. Specifically the Court said:

> From the investor or company point of view it is important that there be enough revenue not only for operating expenses, but also for the capital costs of the business. . . . the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.[2]

Hope suggested that the equity owner (common stockholder) should be allowed to earn a rate of return equal to that earned by other stockholders of firms with similar risk. It is from the *Hope* case that the "comparable earnings" standard as a comparative measure was developed. An important note of the *Hope* case was that the return must be large enough to "attract capital," whereby utilities should earn a return that does not impair the firm's ability to raise funds to meet the needs of the customers.

In summary, the *Bluefield* and *Hope* cases defined that a "just and reasonable" rate of return a utility should earn must be equal to those returns being earned by other firms with similar risk. Unfortunately, neither decision specifically stated how to measure "similar returns" of firms with "corresponding risks."

AN EXAMPLE OF THE RATE-MAKING PROCESS

To more fully explain the difficulties regulatory agencies have in resolving rate debates, this section illustrates a hypothetical utility rate of return decision and the methods of determining rates of return.

A regulatory agency's major responsibility in utility rate cases is to determine the total revenue a utility should generate for a given period of time in order to set a price on the utility service. The process consists of three major components: first, determine the allowed return to capital; second, estimate other costs such as depreciation and operating expenses to determine total revenue requirements; and, third, estimate the total units of service sold during a given period of time in order to place a per unit price on the service.

Figure 1 is a simplified overview of a typical rate-making process. Panel A shows that a regulatory agency must determine a "just and reasonable" return to each source of capital in order to determine the total return to capital. Panel B illustrates the process of determining total revenue requirements for a utility in a given period. Note that total revenue requirements include a return to the equity holders, preferred stockholders and the bondholders. The third part, Panel C, presents the process of pricing the utility service. Assuming utility services can be reasonably forecasted (for example, electric power consumption is mainly a function of population trends and past weather conditions), the price per unit of service can be calculated by dividing the total revenue requirements by the total expected units of service.

To fully appreciate the mechanics of rate regulation, consider a hypothetical electric utility, XYZ Electric Power Co. Assume XYZ Power has a rate base of $100 million that is, the net value of assets committed to public use, and a capital structure consisting of $60 million of long-term debt, $10 million of preferred stock and $30 million of common equity (see Table 1). Note that long-term debt constitutes 60 percent of the rate base, preferred stock 10 percent, and common equity 30 percent.

Table 1

XYZ POWER COMPANY

		Long-Term Debt	$ 60,000,000
	$100,000,000	Preferred Stock	$ 10,000,000
Assets		Common Equity	$ 30,000,000
Rate Base	$100,000,000		$100,000,000

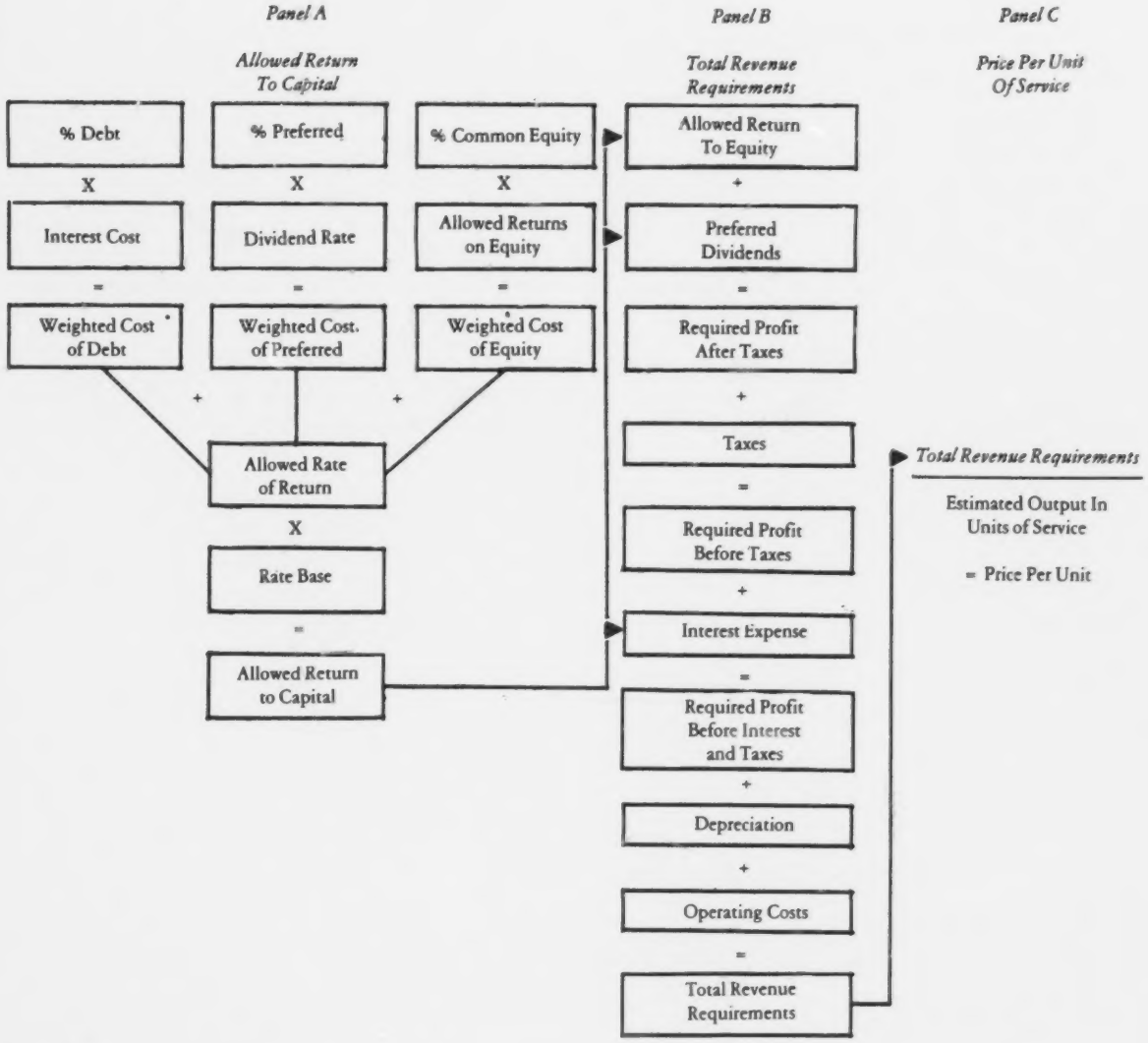
% Long-Term Debt = $60,000,000/$100,000,000 = 60%
% Preferred Stock = $10,000,000/$100,000,000 = 10%
% Common Equity = $30,000,000/$100,000,000 = 30%

Source: Developed by the author.

Assume XYZ Power applies for a rate hearing to determine future rates for the electric service. The regu-

FIGURE I

OVERVIEW OF RATE-MAKING PROCESS

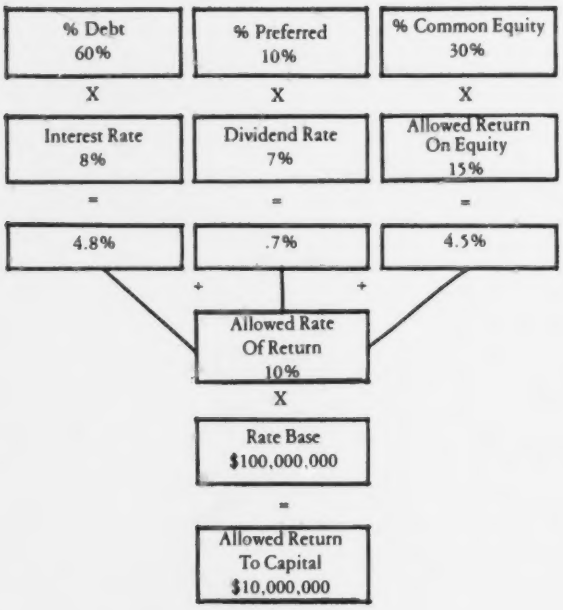


Source: Developed by the author.

latory agency, after some deliberation, resolves that a "fair and reasonable" return on equity should be 15 percent. That implies that enough after-tax revenue must be generated in order for the stockholders to earn a 15 percent rate of return on their investment. Additionally, the actual interest cost on the long-term debt is 8 percent and the preferred stock carries a 7 percent dividend rate. Figure II illustrates the determination of the allowed return to capital. The regulatory agency should multiply the allowed return on each source of capital by the appropriate proportions of each source contributing to the rate base. Given that each source of capital does not contribute the same proportions, a weighted average allowed return of 10 percent is obtained. Multiplying the allowed return of 10 percent by the approved "rate base" yields an allowed return to capital sources of $10 million.

FIGURE II

ALLOWED RETURN TO CAPITAL
XYZ POWER CO.



Source: Developed by the author.

Figure III presents the calculation of the total revenue requirements to be generated using the values of Table 1. Assuming income taxes are 50 percent of income, depreciation on the rate base is $2,800,000 and total operating costs are $52,000,000, total revenue requirements in Figure III would be $70,000,000.

A number of points are notable from Figure III. First, income taxes are based on profits after interest expense but before preferred and common dividends. The regulatory agency must allow only $1 of revenue to cover $1 of interest expense, but must allow approximately $2 of revenue in order to provide $1 of revenue

FIGURE III

TOTAL REVENUE REQUIREMENTS
XYZ POWER CO.

Allowed Return To Equity	$30,000,000 X .15 =	$ 4,500,000
+		
Preferred Dividends	$10,000,000 X .07 =	$ 700,000
=		
Required Profit After Taxes		$ 5,200,000
+		
Taxes (50%)		$ 5,200,000
=		
Required Profit Before Taxes		$10,400,000
+		
Interest Expense	$60,000,000 X .08 =	$ 4,800,000
=		
Required Profit Before Interest & Taxes		$15,200,000
+		
Depreciation (Assumed)		$ 2,800,000
+		
Operating Costs (Assumed)		$55,000,000
=		
Total Revenue Requirements		$70,000,000

Source: Developed by the author.

to the preferred and common stockholders (assuming a 50 percent tax rate). In Figure III, to provide $5,200,000 of revenue ($4,500,000 + $700,000) to the common and preferred stockholders, the regulatory agency must allow profits of $10,400,000 before taxes. Second, the total cost of providing a return to the suppliers of capital and taxes is profit before interest and taxes or $15,200,000. From the view of the consumer, the percentage cost to provide a return to capital and taxes is $15,200,000/$100,000,000 or 15.2 percent.

Assuming the total revenue requirements of $70,000,000 are reasonable, the last step in this simplified example is to set a price per unit of the service XYZ Power provides its customers. For example, if XYZ Power forecasts that 875 million kilowatt hours will be produced during the coming year, the average price per kilowatt hour should be set as follows:

$$\frac{\text{Total Revenue Requirements}}{\text{Number of Kilowatt Hours Forecasted}} = \frac{\$\ 70,000,000}{875,000} = \$.08$$

The consumer would pay, on the average, $.08 per kilowatt hour as long as the rates remain in force. Yet, because of the complexity of the rate regulation process, many other factors must be considered. Practically all of the items in Figure I are subject to controversy and conflicting views. The following is a brief compendium of the major points of contention in regulatory proceedings.

Rate Base

Two principal issues arise in the calculation of the rate base. First, what items should be included or excluded from the base? Increasing the size of the rate base increases the required return to capital, thus increasing the rates consumers pay for utility service. For example, should a partially-completed power plant be included in the rate base although it has not produced any service for the consumer at the present time?

Second and most controversial, what is the dollar value of the rate base? Does a regulatory agency use the net historical cost (original cost less depreciation) of the rate base or rather the current or replacement cost of the assets? Clearly, inflation has caused the replacement cost of certain assets to far exceed their historical cost.[3] This is particularly true for capital intensive industries such as utilities due to the relatively long lives of major capital equipment (i.e., power plants, distribution facilities). In Arizona, utility rate bases are determined on a fair value basis because the Arizona Constitution requires a fair value computation. Specifically, the Constitution requires that the Corporation Commission:

> Ascertain the fair value of property within the state of every public service corporation therein . . . (for) the determination of the value of the property within the state as such public service corporation.[4]

Unfortunately, the Constitution does not specify precisely how fair value should be ascertained. The Corporation Commission has evolved a policy of giving weight to both historical and reproduction cost estimates in determining fair value.[5]

Operating Costs

Most utility operating costs are determined by the market (fuel, wages, salaries) or by various governments (licenses, taxes). In some regulatory proceedings, discretionary expenses such as advertising, research, or perquisites to key executives are challenged by the regulatory agency in addition to the overall operating cost structure being reviewed for reasonableness.

Interest on Long-Term Debt

Regulatory agencies traditionally allow the utility sufficient revenues to cover the historical or "embedded" interest costs on long-term debt to avoid financial insolvency of the utility. However, current interest rates have risen significantly in recent years. If a utility finances a construction project, it clearly borrows at current interest rates, not at historical or embedded rates. Should regulatory agencies allow revenues to cover only past interest costs or anticipate higher future interest rates? If the former position is adopted, the increased borrowing costs reduce the income available to the common stockholders. Utilities then are sometimes forced to seek rate relief to increase allowed revenues to cover higher interest costs.

Rate Schedules

The price of $.08 per kilowatt for XYZ Power was a simplified example assuming only one type of utility user. In reality, there are residential, commercial, industrial, irrigation, and other classes of utility users, each possibly having a separate rate schedule. Regulators, given the total revenue requirements, must determine the individual rates per unit of service each user group is charged to generate the total revenue requirement. In recent years, a number of rate structure inno-

vations have been proposed by various user groups. For example, time-of-day pricing of electric service has been suggested to enable utilities to spread peak power demand over more hours in a given day.[6] Basically, time-of-day pricing puts higher prices per kilowatt hour consumed during peak demand daylight hours and lower prices on off-peak periods such as late evening and early morning. This innovation, however, places burdens on some user groups unable to reallocate usage to off-peak hours.

Equality of Risk

The *Hope* case directed regulatory agencies to allow the common stockholders a rate of return "commensurate with returns on investments having corresponding risks." How does a regulatory agency measure equal risk? Should other regulated utilities be used as a benchmark for equal risk or all other firms in the market? The common approach in regulatory proceedings is to employ similar regulated utilities as the risk comparison on the reasoning that other utilities confront the same investment uncertainties. This approach induces a degree of circular reasoning by regulators. The principal investment risk to a stockholder investing in a utility common stock depends on the regulatory decision. An unfavorable decision from the view of the stockholder will have a tendency to reduce the stock price in the market. To compare the returns of regulated utilities, who are likewise being compared to other regulated utilities, will result in rates of return for all utilities to be the same in the long run.[7] Clearly, this circular reasoning removes the true nature of owning common stock, that is, being the residual owner in the income of the firm while taking the risk of the income of the firm fluctuating over time. A more reasonable approach to investment risk comparisons would be to utilize all similar risk firms, regulated and nonregulated, in analyzing equal investment risk.

FINANCIAL THEORY IN UTILITY REGULATION

The rate of return allowed to the common stockholders usually occupies a prominent place in utility rate cases. How does a regulatory agency measure a "fair and reasonable" rate of return that the utility common stockholders are allowed to earn? In many regulatory jurisdictions, two approaches are commonly used to measure "fair and reasonable" rates of return to the common stockholders.

The first approach is known as the "comparable earnings" standard where the regulatory agency computes the rates of return earned on the book value of the equity in regulated and nonregulated industries. The utility is then allowed a rate of return on the book value of its equity based on the rates other firms earn.[8] However, there are two distinct problems with the "comparable earnings" approach: 1) there is no specific and unambiguous method of determining equality of risk, and 2) accounting methods between regulated and nonregulated firms render comparisons of rate of return on book value almost meaningless.

The second approach for determining rates of return to equity capital is known as the discounted cash flow (DCF) method.[9] It is based on the assumption that investors in common stock place a value on common stocks by discounting the expected cash flows from the equity security. In other words, the market value of a share of common stock is equal to the expected dividends and the eventual liquidation value of the stock discounted at the rate investors require in the market. If investors actually earn the required rate of return, the stock price should remain unchanged. If the investors earn a rate less than the required rate in the market, the stock price should fall. Conversely, if the investors earn a rate more than the required rate, the stock should increase in price. This is the very essence of rate of return regulation: the regulatory agency should allow a rate of return on the market value of the equity that is exactly equal to the rate required in the market. A descriptive model used in DCF analysis states that the required rate of return, R, is equal to the expected yearly dividend, D, divided by the stock price, P, plus the growth rate in dividends, g, over time. Formally, the DCF model is stated as:

$$R = \frac{D}{P} + g$$

For example, assume XYZ Power expects the stock dividend to be \$2.00 in the coming year, the current stock price is \$20.00 and the dividend is expected to grow at an annual rate of 5 percent per year. The estimated required rate of return, R, would be:

$$R = \frac{\$2.00}{\$20.00} + 5\% = 10\% + 5\% = 15\%$$

If that rate is applied to the *market* value of XYZ Power's common stock, investors should earn exactly 15 percent on their investment. What is important in this

approach is that investors are earning a rate of return based on the *market* value of their investment.

Regulatory agencies should examine how their decisions affect the market value of the common stock rather than the book value because investors are concerned with the actual rate of return earned on the stock in the market. Rate of return on the book value of the common equity is found by dividing net income earned during the year by the book value of the common equity. While the rates of return on book value may remain relatively constant during a given period, the rates of return earned by the investor in the market may vary over a wide range. Setting stable rates of return on book value does not necessarily lead to a stable rate of return in the market.

An important fact in utility regulation is that regulation is designed to be a substitute for competition where natural monopolies, such as utilities, are licensed to operate. To set stable rates of return on the book value of the equity is contrary to the true nature of a risky equity security. Utilities should be rewarded in terms of higher stock prices when management is efficient in managing resources. When rates of return on equity securities of nonregulated firms are rising, regulators should allow utility common stocks a similar higher rate of return. Failure to adjust rates would unduly penalize utility investors. Conversely, regulators should allow rates of return on utility common stocks to decline in falling equity markets to ensure that consumers of utility services are not charged rates higher than are necessary.

Vigorous and active utility regulation operates in the best interests of both consumers and investors. Fair and reasonable allowed rates of return enable utilities to attract resources, both human and financial, that are necessary for the continued delivery of utility services. Consumers are benefited by the fact that utility rates are based on rigorous scrutiny of costs. The only means of maintaining a viable energy supply is through the administration of a fair and reasonable price.

CONCLUSION

Utility regulation is a process of balancing the competing interests of consumers and investors in a noncompetitive environment. Utilities are natural monopolies designed to provide services to customers at a price consistent with the costs and risks inherent in producing the srevice. This article presents an overview of the process of determining the rates of return utilities should be allowed to earn and the price necessary to generate those returns. If investor-owned public utilities are a desirable objective of society, diligent and thoughtful regulation must be present to ensure that the financial integrity of utilities is maintained while providing consumers low-cost utility services. To pursue any other course implies that one group in society will benefit at the expense of another group and is conducive to the ultimate demise of privately-owned public utilities.

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[1]*Bluefield Water Works and Investment Company v. Public Service Commission of the State of West Virginia*, 262 U. S. 679 (1923).

[2]*Federal Power Commission v. Hope Natural Gas Company*, 320 U. S. 591 (1944).

[3]S. Kumar, "How Fair is Fair Valuation of Rates Bases?," *Public Utilities Fortnightly*, Vol. 104, 2 (July 19, 1979), pp. 27-29.

[4]Article XV P. VIV, *Arizona Constitution*.

[5]For a complete discussion of this issue, see Robert L. Knox, "Public Utility Regulation in Arizona," *Arizona Business*, Vol. XVII 3 (March, 1970), pp. 3-12.

[6]Richard Pierce, "Time-of-Day Rates: A Statement," *Public Utilities Fortnightly*, Vol. 103, 12 (June 7, 1979), pp. 19-22.

[7]Alexander Robicheck, "Regulation and Modern Finance Theory," *Journal of Finance*, Vol. XXXIII 3 (June, 1978), pp. 693-705.

[8]*Ibid*, p. 701.

[9]J. Fred Weston and E. F. Brigham, *Managerial Finance* (Hinsdale, Illinois: Dryden Press, 1978), p. 700.

The Arizona Business Scene

Inflation and Interest Rates

Interest rates (such as the Treasury bill rate, prime rate, and mortgage rate) increased rapidly in the fall of 1980, surpassing the levels reached in the early spring of 1980. As the rates reached levels never seen before, many people questioned whether the rates were unreasonably high. One approach to answering this question deals with analyzing the relationship between inflation and interest rates over a period of time. Interest rates are directly related to the rate of inflation. As inflation increases so do interest rates. In the late 1960s when inflation was 3 to 4 percent, the prime rate was 5 to 6 percent. Now inflation is much higher, and so are interest rates. An examination of the history of inflation and interest rates is in order before looking at their current relationship.

The Treasury bill (T-bill) rate is a representative example of a short-term *interest* rate. With the money market certificate offered by banks and savings and loan associations tied to the six-month Treasury bill rate, this rate has become more relevant to the general public since 1978. Treasury bill rates help set the level of lending rates since T-bills represent a cost to the lender to obtain the funds which it will then lend. Before the large increase in the inflation rate in the early 1970s, the T-bill rate averaged about 1 percentage point higher than the inflation rate. A T-bill rate higher than the inflation rate provides the saver with a positive "real" (inflation-adjusted) return, as would be expected to entice savings. Since 1973, however, Treasury bill rates have not kept pace with the inflation rate, averaging 1 to 1.5 percentage points below the rate of inflation. Thus, savers since 1973 have generally been receiving a negative real return in the absence of tax considerations, certainly not an incentive to save.

The prime rate, in turn, is a representative example of a short-term *lending* rate. The prime interest rate is set depending upon several factors, including the inflation rate and short-term interest rates, such as the T-Bill rate and the Federal Reserve discount rate. Prior to the period of more rapid inflation, the prime rate was generally set about 1 percentage point higher than the T-bill rate, and about 2 percentage points above the rate of inflation. A prime rate higher than both the inflation rate and the lenders' cost of money (short-term interest rates) provides lenders with a positive real return, required for lenders to make a profit. Since 1973, however, the prime rate has averaged only about one-half percentage point above the rate of inflation. This decrease in spread has been partially offset by a somewhat greater spread between the prime rate and the short-term cost of money. Thus, lenders are receiving a smaller real return than they were previously on short-term loans, despite charging a much higher rate to borrowers.

The same situation is true for long-term lending rates, such as the mortgage rate. Before 1973, the conventional mortgage rate was generally a little more than 2 percentage points above the short-term cost of money, and a little more than 3 percentage points above the inflation rate. This again provides a positive

real return on the investment for the lender. Since 1973, the mortgage rate has maintained its spread over the short-term rates, but the spread over the inflation rate is down to only 1 percentage point. Thus, lenders are receiving a smaller real return on new mortgages than previously.

In general, from 1973 to 1979 neither short-term interest rates received by savers, nor lending rates (both short and long) have kept pace with inflation. Thus, even though both savings and lending interest rates rose to historically high levels, both savers and lenders are being hurt by inflation. It is the borrower that has benefited from high inflation. Even though the interest rates charged to borrow money have been historically high, these rates are a relative bargain compared to inflation. These conditions help to explain why Americans (including Arizonans) have been saving less and borrowing more in recent years. Tax considerations make borrowing even more attractive.

Given this history, how do 1980 interest rates stack up? Twice in 1980 interest rates reached levels far above those previously reached — in April and again in December. At their peak in April, Treasury bill and other short-term rates as compared to inflation were above the level that was common in the period from 1973 to 1979, but not above the level that was common previous to 1973. These levels are explained earlier in this article. In late spring, 1980 rates plummeted to far below the rate of inflation. The increase in rates in the fall was therefore inevitable, though the level reached by December was higher than the historical spread from the inflation rate. This large spread was due to both higher interest rates than in April and to a decrease in the rate of inflation since the spring of 1980. Thus, until December, T-bill and other short-term rates were not disproportionately high compared to inflation. The average T-bill rate for 1980 was actually approximately 2 percentage points below the average inflation rate.

The prime rate and other short-term lending rates have behaved similarly to the short-term cost of money rates. The peak rates reached in April and December produced a historically large spread between both short-term interest rates and the inflation rate. The rates in effect in the summer, however, were considerably below the inflation rate. A comparison of the prime rate to other rates is shown in Table 1. Using only the narrow view of historical relationships between interest rates and inflation, the prime rate has been disproportionately high in both of the peak periods, although the yearly average was approximately equal to the historic spread between the inflation rate and the prime rate.

Other factors influence the level of lending rates, however, besides the inflation rate and short-term interest rates. An unprecedented large demand for loans, combined with an unprecedented low savings rate (a major source of loanable funds) has created an imbalance between the supply and demand of loanable funds. This imbalance has to be adjusted by the lending rate. In addition, the interest rate on savings accounts of over $100,000, another source of loanable funds, was as high as 21 percent in 1980. Thus, while the prime rate has had a historically large spread compared to most short-term interest rates and the rate of inflation, a prime rate as high as 20 percent or more is justified given the low supply of savings, the heavy demand for loans, and the cost of some funds. During peak interest rate periods in 1980, however, borrowers secured loans at rates much higher than the rate of inflation. This heavy demand for loans at high interest rates has forced the interest rates even higher. Thus, the willingness of borrowers to accept high rates is at least partially responsible for the very high interest rates dur-

TABLE 1

THE PRIME RATE COMPARED TO INFLATION AND OTHER INTEREST RATES

	1965-1972	*1973-1979*	*December 1979*	*March 1980*	*June 1980*	*September 1980*	*December 1980*
Prime rate, percent	5.9	8.9	15.3	18.3	12.6	12.2	19.8
Difference between prime rate and inflation[a] (in percentage points)	2.1	.6	2.6	4.4	(.9)	.1	6.3
Discount rate	1.1	1.8	3.3	5.3	.6	2.2	7.0
Treasury bill rate	.9	1.75	3.2	2.8	5.6	1.9	4.4

[a]Measured by The Consumer Price Index.

Source: Federal Reserve Bulletin, Board of Governors of the Federal Reserve System, various issues; and *The Wall Street Journal*, various issues.

ing parts of 1980. At these times, borrowers are no longer benefiting from inflation.

The situation with long-term mortgage loans is somewhat different. Even at peak levels of about 16 percent, the mortgage lending rate has not been too high given its historical relationship to inflation and the cost of money. During the summer, mortgage rates, like all other rates, dropped to a relatively low level compared to inflation. Borrowers were then able to obtain a mortgage at about the same rate as inflation. Mortgage rates did not reach as high a peak as the prime rate in 1980 despite heavy demand, possibly because many applicants could not qualify for a mortgage loan at the higher rates, effectively reducing the demand for these loans.

Interest rates have fluctuated widely during 1980. Compared to inflation, interest rates have been both high and low for brief periods during the year, but have averaged near the levels common in recent years. At times, short-term lending rates have been high compared to their historical relationship with inflation, due to the relatively short supply of loanable funds and the willingness of borrowers to borrow short-term money at very high rates. During the periods of peak rates this has removed the benefits from inflation that borrowers have received in recent years. Otherwise, both savers and lenders have continued to suffer from inflation while borrowers have benefited. Interest rates in Arizona have been comparable to the national average over the past several years. The inflation rate in Arizona over the long term has also been comparable to the national average, though in the last three years the rate in Arizona has been higher. This means that high interest rates are even more justifiable in Arizona than in much of the rest of the nation.

ARIZONA SALES OF ELECTRICAL POWER
By Months in Millions of KWH*

	Actual:		*Percent Change Current Month From*	
Current Month:	*1980 (Year)*	*1979 (Year)*	*Same Month/ Prev. Year*	*Previous Month*
November	2092.4	2047.8	2.2	-8.6

* Based on reports from major suppliers.

A Survey of Arizona Business Conditions

HAROLD FEARON

Following four months of lackluster growth, economic activity dipped slightly in December, according to results from the monthly business survey of the Purchasing Management Association of Arizona. The upswing which began in August after the very short recession over the summer months never really gained momentum, and now it appears to have run out of steam entirely. Inventory levels of purchased materials, new orders received from customers, and production all fell in December. Employment showed no change, while prices continued to increase. The inability of the economy to hold its slight gains, due largely to the very high interest levels and expectations of continued high interest and inflation rates, has dampened the near-term outlook and makes the possibility of a double-dip recession appear quite likely. Nevertheless, the lean inventory position Arizona firms are maintaining, plus plans to increase plant and equipment investment in 1981, are encouraging signs and should cushion the effects of a second downswing, making it of short duration.

The purchasing business survey is now in its nineteenth year of consecutive monthly reporting on the current status of the Arizona economy. Data are gathered through a questionnaire sent at the close of each month to purchasing managers throughout the state, asking them to indicate the direction of activity — higher, unchanged, or lower — on six key indicators of economic activity in the month just ended. Since these purchasing managers deal daily with the forces of supply and demand, they are in a prime position to provide timely and accurate information on current business trends, which enables economic turning points to be spotted.

Prices paid for major purchased items went up again in December, but at a slightly smaller rate than recorded in the previous two months. Fifty-seven percent of the purchasing managers reported paying higher prices in December than in November; 39 percent saw prices unchanged; and only 4 percent said prices declined. While the inflation rate did moderate slightly in the third quarter of the year as the recession hit bottom, this reduction in inflationary pressure was short lived and has made it difficult for the recovery to gain momentum. The very high interest rates should begin to slow down the inflationary trend, but it will take several months for this medicine to become really effective, and the side effects likely will be a further period of level or negative economic activity.

Delivery time on shipments from vendors continued to stretch out, and at a rate only slightly higher than in the previous few months. Longer delivery times were reported by 29 percent of the firms; 10 percent said they received faster service from their suppliers. While delivery times have been positive for the past five months, the increases have been marginal and far under those

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experienced during a normal economic upswing, indicating that the recovery really never developed a strong base from which to move.

Inventory levels of purchased materials registered a slight decrease, following November's net increase. Inventory additions were reported by 27 percent of the firms, which was countered by a slightly larger 29 percent reporting a reduction in stocks. As the Arizona economy continues to follow a level or negative trend, firms likely will hold a tight rein on stocks, which at the current interest rates have become increasingly expensive to maintain. Yet there do not appear to be any major inventory excesses, so the possibility that inventory liquidations will cause a snowball effect during the downswing appears remote.

New orders received from customers declined in December, following four consecutive months of moderate increases. Twenty-five percent of the firms booked more new business in December than in November, but a larger 33 percent saw a shrinkage in their order books. Evidently, the slowdown in business activity is widespread, and customers are being cautious in their decisions to place new orders.

Production also dropped, mirroring closely the declining new order trend. This drop follows four consecutive monthly production increases. Higher production was reported by 26 percent of the firms, compared to the larger 35 percent who cut output. Further reductions will occur until the new order rate turns positive again.

Employment showed no change in December, following the previous three months of moderate increases. The 15 percent who added employees was balanced out by the same percentage who pared payrolls. If further new order decreases occur over the first quarter of 1981, employment cuts will materialize.

The special question, asked each December, covering *anticipated* expenditures for new plant and equipment during 1981 indicates that the step-up in investment which occurred during 1980 will continue into the new year. This marks the sixth straight year of an upward trend in expectations, which began in December of 1975, although the strength of the increase is smaller than in each of the past four years. Nevertheless, even if the investment growth does moderate somewhat, it still should provide a source of economic stimulus in the year to come.

When asked to compare capital expenditures *anticipated for 1981* with those actually made in 1980, 49 percent said their firm would spend more; 27 percent expect no change; and 24 percent forcast a decline. The results from this special question over the past seven years are shown in Table 1.

TABLE 1

ANTICIPATED CAPITAL EXPENDITURES

Expenditures anticipated for new plant and equipment	*Percentage of Firms*		
	Higher	*Same*	*Lower*
1981 compared to 1980	49	27	24
1980 compared to 1979	54	29	17
1979 compared to 1978	55	28	17
1978 compared to 1977	54	30	16
1977 compared to 1976	48	37	15
1976 compared to 1975	41	28	31
1975 compared to 1974	21	31	48

Source: Survey of the Purchasing Management Association of Arizona.

On balance, 1980 has been a year of adjustment for the Arizona economy. The long and predicted recession finally did arrive, following an expansion of record length. The recession of the summer was very short and shallow in magnitude; however, the upswing never gained any real momentum and now has been cut short. Until interest rates and prices moderate, it is unlikely that any major growth trend will resume. However, the anticipated capital expenditures in 1981 will be a major positive stimulus to a resumption of growth after the readjustment finally works itself out.

The results of the December survey are shown in Table 2.

TABLE 2

DECEMBER PURCHASING SURVEY

Key Indicators	*Percent of Purchasing Managers Indicating Each Response (December compared to November)*		
	Higher	*Same*	*Lower*
Prices paid for major commodities	57	39	4
Delivery time from vendors	29	61	10
Purchased materials inventory level	27	44	29
New orders received	25	42	33
Production	26	39	35
Employment	15	70	15

Source: Survey of the Purchasing Management Association of Arizona.

Arizona Building Permits: Monthly Report

NOVEMBER, 1980

	RESIDENTIAL*		COMMERCIAL		INDUSTRIAL		OTHER		TOTAL	
	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value
APACHE COUNTY	8	158,150	3	96,000	—	—	1	6,000	12	260,150
Eagar	3	128,500	1	50,000	—	—	—	—	4	178,500
St. Johns	2	N/C	—	—	—	—	—	—	2	N/C
Springerville	—	—	—	—	—	—	—	—	—	—
Unincorporated Apache County	3	29,650	2	46,000	—	—	1	6,000	6	81,650
COCHISE COUNTY	90	1,588,016	3	185,000	—	—	61	169,563	154	1,942,579
Benson	2	9,000	—	—	—	—	3	27,300	5	36,300
Bisbee	9	22,000	—	—	—	—	1	4,000	10	26,000
Douglas	10	261,513	—	—	—	—	10	38,788	20	300,301
Huachuca City	6	3,895	—	—	—	—	—	—	6	3,895
Sierra Vista	25	405,432	2	130,000	—	—	32	51,075	59	586,507
Tombstone	4	46,500	1	55,000	—	—	—	—	5	101,500
Unincorporated Cochise County	32	838,476	—	—	—	—	13	44,900	45	883,376
Willcox	2	1,200	—	—	—	—	2	3,500	4	4,700
COCONINO COUNTY	96	2,430,620	9	494,678	—	—	39	47,331	144	2,972,629
Flagstaff	19	1,021,994	6	288,110	—	—	21	27,731	46	1,337,835
Fredonia	—	—	1	500	—	—	—	—	1	500
Page	10	179,720	—	—	—	—	3	N/C	13	179,720
Unincorporated Coconino County	62	1,170,129	2	206,068	—	—	5	N/C	69	1,376,197
Williams	5	58,777	—	—	—	—	10	19,600	15	78,377
GILA COUNTY	52	885,279	4	692,978	—	—	12	13,810	68	1,592,067
Globe	7	87,000	—	—	—	—	3	650	10	87,650
Hayden	1	2,000	—	—	—	—	—	—	1	2,000
Miami	4	6,000	—	—	—	—	—	—	4	6,000
Payson	16	168,079	3	667,978	—	—	9	13,160	28	849,217
Unincorporated Gila County	24	622,200	1	25,000	—	—	—	—	25	647,200
GRAHAM COUNTY	38	646,510	4	233,300	—	—	1	500	43	880,310
Pima	—	—	—	—	—	—	—	—	—	—
Safford	9	151,400	3	81,300	—	—	1	500	13	233,200
Thatcher	12	242,500	—	—	—	—	—	—	12	242,500
Unincorporated Graham County	17	252,610	1	152,000	—	—	—	—	18	404,610
GREENLEE COUNTY	—	—	—	—	—	—	—	—	—	—
Clifton	—	—	—	—	—	—	—	—	—	—
Duncan	—	—	—	—	—	—	—	—	—	—
Unincorporated Greenlee County	—	—	—	—	—	—	—	—	—	—
MARICOPA COUNTY	1,859	46,042,530	150	53,369,011	40	12,038,842	1,239	11,225,101	3,288	122,675,484
Avondale	7	78,970	—	—	2	59,000	13	24,820	22	162,790
Buckeye	5	72,500	1	20,000	—	—	3	11,419	9	103,919
Chandler	66	1,435,023	3	170,648	2	1,185,000	74	370,588	145	3,161,259
El Mirage	3	48,000	1	150,000	—	—	—	—	4	198,000
Gila Bend	1	1,500	—	—	—	—	1	2,200	2	3,700
Gilbert	4	251,980	—	—	—	—	16	32,816	20	284,796
Glendale	321	8,227,460	10	4,125,200	2	3,153,000	172	715,827	505	16,221,487
Goodyear	—	—	—	—	—	—	7	4,100	7	4,100
Guadalupe	2	8,000	—	—	—	—	2	2,880	4	10,880
Mesa	121	3,814,921	12	7,642,391	2	257,000	215	2,652,264	350	14,366,576
Paradise Valley	25	1,432,815	—	—	—	—	23	123,098	48	1,555,913
Peoria	15	272,630	3	220,552	1	168,000	21	72,981	40	734,163
Phoenix	606	16,244,950	35	24,264,354	16	4,627,542	392	3,927,304	1,049	49,064,150
Scottsdale	93	4,025,022	48	13,934,370	—	—	144	754,014	285	18,713,406
Surprise	5	36,900	—	—	—	—	7	1,803,862	12	1,840,762
Tempe	90	1,898,700	18	1,030,800	15	2,589,300	21	330,700	144	5,849,500
Tolleson	4	17,800	—	—	—	—	—	—	4	17,800
Unincorporated Maricopa County	461	7,965,077	18	1,774,696	—	—	122	394,178	601	10,133,951
Wickenburg	2	27,500	1	36,000	—	—	—	—	3	63,500
Youngtown	28	182,782	—	—	—	—	6	2,050	34	184,832

Arizona Building Permits: Monthly Report (Continued)

NOVEMBER, 1980	RESIDENTIAL*		COMMERCIAL		INDUSTRIAL		OTHER		TOTAL	
	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value
MOHAVE COUNTY	273	4,066,405	18	1,920,248	—	—	200	313,930	491	6,300,583
Kingman City	19	412,431	4	129,842	—	—	1	450	24	542,723
Kingman Area	36	401,976	4	350,140	—	—	35	38,762	75	790,878
Lake Havasu City	57	1,629,843	7	769,730	—	—	19	84,299	83	2,483,872
Lake Havasu Area	3	13,440	—	—	—	—	7	7,560	10	21,000
Mohave Valley North	90	920,529	2	662,736	—	—	81	93,812	173	1,677,077
Mohave Valley South	56	569,417	—	—	—	—	36	39,736	92	609,153
Dolan Springs	3	55,332	—	—	—	—	5	42,088	8	97,420
Sacramento Valley	8	61,997	—	—	—	—	15	6,053	23	68,050
Mohave County General	1	1,440	1	7,800	—	—	1	1,170	3	10,410
NAVAJO COUNTY	64	1,224,962	2	56,640	—	—	3	15,600	69	1,297,202
Holbrook	3	50,000	—	—	—	—	—	—	3	50,000
Show Low	4	34,924	—	—	—	—	—	—	4	34,924
Snowflake	3	N/C	—	—	—	—	—	—	3	N/C
Taylor	1	3,000	—	—	—	—	—	—	1	3,000
Unincorporated Navajo County	52	1,127,038	2	56,640	—	—	—	—	54	1,183,678
Winslow	1	10,000	—	—	—	—	3	15,600	4	25,600
PIMA COUNTY	829	21,601,885	40	17,762,415	2	126,600	440	3,586,179	1,311	43,077,079
Marana	1	N/C	—	—	—	—	1	N/C	2	N/C
Oro Valley	2	150,000	—	—	—	—	—	—	2	150,000
South Tucson	14	108,322	1	800	—	—	—	—	15	109,122
Tucson	284	6,209,913	18	11,732,115	2	126,600	194	3,163,777	498	21,232,405
Unincorporated Pima County	528	15,133,650	21	6,029,500	—	—	245	422,402	794	21,585,552
PINAL COUNTY	93	834,341	5	261,746	—	—	25	198,350	123	1,294,437
Casa Grande	12	177,958	2	151,746	—	—	4	8,400	18	338,104
Coolidge	27	75,754	—	—	—	—	5	16,000	32	91,754
Eloy	4	52,800	—	—	—	—	1	8,000	5	60,800
Florence	1	3,500	—	—	—	—	2	135,350	3	138,850
Kearny	1	1,000	—	—	—	—	1	100	2	1,100
Mammoth	—	—	1	N/C	—	—	—	—	1	N/C
Superior	2	2,000	—	—	—	—	1	900	3	2,900
Unincorporated Pinal County	46	521,329	2	110,000	—	—	11	29,600	59	660,929
SANTA CRUZ COUNTY	27	751,144	2	102,196	—	—	6	144,774	35	998,114
Nogales	19	447,725	1	92,196	—	—	1	99,820	21	639,741
Patagonia	—	—	—	—	—	—	2	260	2	260
Unincorporated Santa Cruz County	8	303,419	1	10,000	—	—	3	44,694	12	358,113
YAVAPAI COUNTY	202	5,015,991	9	573,205	1	36,000	75	442,468	287	6,067,664
Chino Valley	9	225,100	—	—	—	—	8	3,515	17	228,615
Clarkdale	3	21,500	—	—	—	—	1	70,172	4	91,672
Cottonwood	10	134,046	1	9,995	—	—	2	650	13	144,691
Jerome	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
Prescott	47	862,426	7	522,960	—	—	41	281,053	95	1,666,439
Unincorporated Yavapai County	111	3,474,991	—	—	—	—	23	87,078	134	3,562,069
Prescott Valley	22	297,928	1	40,250	1	36,000	—	—	24	374,178
YUMA COUNTY	126	2,251,593	17	1,734,015	—	—	10	50,157	153	4,035,765
Parker	3	10,150	—	—	—	—	—	—	3	10,150
Somerton	2	26,500	—	—	—	—	1	1,000	3	27,500
Unincorporated Yuma County	99	1,787,959	15	1,648,025	—	—	1	2,150	115	3,438,134
Wellton	1	4,000	—	—	—	—	—	—	1	4,000
Yuma	21	422,984	2	85,990	—	—	8	47,007	31	555,981
TOTAL Maricopa County, November, 1980	1,859	46,042,530	150	53,369,011	40	12,038,842	1,239	11,225,101	3,288	122,675,484
TOTAL Maricopa County November, 1979	1,907	39,592,724	259	34,005,104	56	10,507,526	1,802	25,763,180	4,024	109,868,534
PERCENT CHANGE	-3.	16.	-42.	57.	-29.	15.	-31.	-56.	-18.	12.
TOTAL Arizona, November, 1980	3,757	87,497,426	266	77,481,432	43	12,201,442	2,112	16,213,763	6,178	193,394,063
TOTAL Arizona, November, 1979	4,118	77,297,473	452	57,143,998	58	10,638,526	2,455	33,592,931	7,083	178,672,928
PERCENT CHANGE	-9.	13.	-41.	36.	-26.	15.	-14.	-52.	-13.	8.

*Includes mobile homes. N/R: No report. N/C: Not collected.

Arizona New Housing Starts: Monthly Report

NOVEMBER, 1980

	BUILDING PERMITS ISSUED				
	1* Family	Duplex	3-4 Families	5 or More	Housing Units
APACHE COUNTY	8	—	—	—	8
Eagar	3	—	—	—	3
St. Johns	2	—	—	—	2
Springerville	—	—	—	—	—
Uninc. Apache Co.	3	—	—	—	3
COCHISE COUNTY	43	—	—	—	43
Benson	1	—	—	—	1
Bisbee	—	—	—	—	—
Douglas	3	—	—	—	3
Huachuca City	—	—	—	—	—
Sierra Vista	11	—	—	—	11
Tombstone	1	—	—	—	1
Uninc. Cochise Co.	27	—	—	—	27
Willcox	—	—	—	—	—
COCONINO COUNTY	64	1	—	1	73
Flagstaff	14	1	—	1	23
Fredonia	—	—	—	—	—
Page	9	—	—	—	9
Uninc. Coconino Co.	39	—	—	—	39
Williams	2	—	—	—	2
GILA COUNTY	30	—	—	—	30
Globe	2	—	—	—	2
Hayden	—	—	—	—	—
Miami	—	—	—	—	—
Payson	12	—	—	—	12
Uninc. Gila Co.	16	—	—	—	16
GRAHAM COUNTY	20	—	1	—	24
Pima	—	—	—	—	—
Safford	2	—	1	—	6
Thatcher	5	—	—	—	5
Uninc. Graham Co.	13	—	—	—	13
GREENLEE COUNTY	—	—	—	—	—
Clifton	—	—	—	—	—
Duncan	—	—	—	—	—
Uninc. Greenlee Co.	—	—	—	—	—
MARICOPA COUNTY	1,187	17	16	34	2,142
Avondale	7	—	—	—	7
Buckeye	3	—	—	—	3
Chandler	42	1	3	—	54
El Mirage	3	—	—	—	3
Gila Bend	—	—	—	—	—
Gilbert	3	—	—	—	3
Glendale	307	—	1	—	311
Goodyear	—	—	—	—	—
Guadalupe	—	—	—	—	—
Mesa	77	8	6	1	450
Paradise Valley	11	—	—	—	11
Peoria	11	—	—	—	11
Phoenix	367	5	1	6	500
Scottsdale	45	1	1	26	451
Surprise	2	—	—	—	2
Tempe	33	—	3	1	52
Tolleson	—	—	—	—	—
Uninc. Maricopa Co.	270	2	1	—	278
Wickenburg	2	—	—	—	2
Youngtown	4	—	—	—	4

*Includes mobile homes. N/R: No Report.

	BUILDING PERMITS ISSUED				
	1* Family	Duplex	3-4 Families	5 or More	Housing Units
MOHAVE COUNTY	144	—	2	—	152
Kingman City	13	—	—	—	13
Kingman Area	20	—	2	—	28
Lake Havasu City	42	—	—	—	42
Lake Havasu Area	1	—	—	—	1
Mohave Valley North	38	—	—	—	38
Mohave Valley South	24	—	—	—	24
Dolan Springs	2	—	—	—	2
Sacramento Valley	4	—	—	—	4
Mohave Co. General	—	—	—	—	—
NAVAJO COUNTY	43	—	—	—	43
Holbrook	1	—	—	—	1
Show Low	3	—	—	—	3
Snowflake	2	—	—	—	2
Taylor	—	—	—	—	—
Uninc. Navajo Co.	37	—	—	—	37
Winslow	—	—	—	—	—
PIMA COUNTY	552	5	2	9	1,163
Marana	1	—	—	—	1
Oro Valley	2	—	—	—	2
South Tucson	2	—	—	—	2
Tucson	156	5	2	9	767
Uninc. Pima Co.	391	—	—	—	391
PINAL COUNTY	37	—	2	—	45
Casa Grande	2	—	—	—	2
Coolidge	2	—	—	—	2
Eloy	1	—	—	—	1
Florence	—	—	—	—	—
Kearny	—	—	—	—	—
Mammoth	—	—	—	—	—
Superior	1	—	—	—	1
Uninc. Pinal Co.	31	—	2	—	39
SANTA CRUZ COUNTY	15	—	—	—	15
Nogales	7	—	—	—	7
Patagonia	—	—	—	—	—
Uninc. Santa Cruz Co.	8	—	—	—	8
YAVAPAI COUNTY	132	9	—	—	156
Chino Valley	9	—	—	—	9
Clarkdale	1	—	—	—	1
Cottonwood	2	2	—	—	6
Jerome	N/R	N/R	N/R	N/R	N/R
Prescott	21	3	—	—	33
Uninc. Yavapai Co.	87	4	—	—	95
Prescott Valley	12	—	—	—	12
YUMA COUNTY	70	1	7	2	108
Parker	—	—	—	—	—
Somerton	1	—	—	—	1
Uninc. Yuma Co.	63	1	6	2	98
Wellton	—	—	—	—	—
Yuma	6	—	1	—	9
TOTAL, Maricopa Co., November, 1980	1,187	17	16	34	2,142
TOTAL, Maricopa Co., November, 1979	1,168	15	19	30	2,056
PERCENT CHANGE	2.	13.	-16.	13.	4.
TOTAL, Arizona, November, 1980	2,345	33	30	46	4,002
TOTAL, Arizona, November, 1979	2,523	28	23	42	3,906
PERCENT CHANGE	-7.	18.	30.	10.	2.

Retail Food Prices

DECEMBER, 1980

Retail food prices in Maricopa County rose 1.4 percent in December, following an 0.8 percent gain in November.

The food price survey is compiled by the Bureau of Business and Economic Research, College of Business Administration, at Arizona State University. Cosponsor of the study is Valley National Bank. The December index of 255.6 indicates that shoppers would now have to pay $25.56 for a similar basket of foods that would have cost $10.00 in 1967. These foods could have been purchased for $23.13 one year ago. The December, 1980 index reflects a 10.5 percent increase over the December, 1979 value.

The gain in this month's index was a result of increases in all of the subgroups. The largest hikes occurred in *Dairy Products* and *Fruits and Vegetables* (both 2.5 percent), followed by gains of 1.2 percent in *Meats, Poultry, Fish, and Eggs* and 0.9 percent in *Other Foods*. *Cereals and Bakery Products* showed a modest 0.2 percent increase.

Prices in all categories of *Dairy Products* were higher this month than in November, except for butter. Increases included 2.6 percent for cheese, 3.8 percent for ice cream and related products, and 8.2 percent for other dairy products.

A surge in tomato prices (45.3 percent) led the increase in *Fruits and Vegetables*. Miscellaneous fresh vegetables also increased (16.4 percent), which includes carrots, celery, green beans, and cucumbers. These increases were partially offset by decreases in the prices of lettuce (-16.6 percent) and potatoes (-8.0 percent).

Climbing prices for beef, poultry, and eggs contributed to gains in *Meats, Poultry, Fish, and Eggs* in December. Prices for eggs jumped 8.3 percent, followed by noncanned ham (6.1 percent, the fifth straight month of large increases), poultry other than chicken (particularly turkey; 6.0 percent), and ground beef (4.2 percent). These increases were partially counteracted by lower prices for lunchmeat, fish and seafood, and pork.

Increases in several categories of *Other Foods* contributed to that group's overall gain. The largest price increases were for cola drinks, excluding diet cola, (8.1 percent); and nuts, potato chips, and other snacks (particularly peanuts, 5.4 percent). Falling prices were noted for carbonated drinks other than colas (-9.9 percent, due to several sales in December) and for coffee, both roasted (-2.8 percent) and freeze dried and instant (-2.4 percent). Coffee prices fell for the third consecutive month.

Most *Cereal and Bakery Products* had little change in price in December. Cereals increased 2.5 percent and sweetrolls, coffeecake and doughnuts increased 2.0 percent. Fresh cakes and cupcakes decreased 3.4 percent.

A comparison of September Food Consumed at Home for Maricopa County with index values for four selected metropolitan areas reveals that the outlays required to purchase a foodstuffs group in September, 1980 (obtainable for an outlay of $10.00 at 1967 average prices) were $24.95 in Maricopa County; $25.81 in Los Angeles-Long Beach; $25.78 in San Francisco-Oakland; $26.07 in Chicago-Northwestern Indiana; and averaged $25.89 in the United States.

INDEX FOR FOOD CONSUMED AT HOME
(Average 1967 = 100 percent)

	Maricopa County Dec. '80[a]	*Maricopa County Sept. '80[b]*	*United States[c] Sept. '80*	*Los Angeles-Long Beach[c] Sept. '80*	*San Francisco-Oakland[c] Sept. '80*	*Chicago[c] Northwestern Indiana Sept. '80*
Food Consumed at Home	255.6	249.5	258.9	258.1	257.8	260.7
Cereals and Bakery Products	237.7	231.7	250.3	260.0	256.6	256.7
Meats, Poultry, Fish, and Eggs	264.6	258.3	251.8	254.0	257.0	259.5
Dairy Products	225.5	213.7	230.6	225.1	225.7	224.9
Fruits and Vegetables	236.9	239.8	257.4	245.9	245.7	255.8
Other Foods Consumed at Home	283.6	275.7	309.2	305.1	309.6	312.5

[c]Computed from data contained in *The Consumer Price Index*, U.S. Department of Labor, Bureau of Labor Statistics, Washington, D.C.
[a]Maricopa County food prices are reported for the month closest to publication.
[b]Comparisions of food prices among various cities and the United States average are made on the basis of earlier months because of the lag in collecting price reports from these other areas.
Note: Index Comparisons between Maricopa County and the other regions show only that food prices in Maricopa County have increased more or less than food prices in the other regions since 1967. The indices cannot be used to determine the actual differences in food price levels between the regions.
Source: Bureau of Business and Economic Research, College of Business Administration, Arizona State University, in cooperative cosponsorship with Valley National Bank.

Metropolitan Phoenix Consumer Price Index

FOURTH QUARTER, 1980

Prices of consumer goods and services in the Phoenix metropolitan area rose 3.3 percent during the fourth quarter of 1980, a higher increase than the third quarter rate of 2.6 percent. The rise in prices for the Phoenix area is higher than the increase posted for the United States as a whole (2.7 percent), but is equal to the increase for the comparison city of Los Angeles-Long Beach (3.3 percent) and considerably less than the 6.0 percent for Chicago. Since the fourth quarter of 1979, the 13.3 percent change for Phoenix is higher than the 12.6 percent increase for the nation as a whole, but lower than the increase for Chicago (15.1 percent) and Los Angeles-Long Beach (14.0 percent).

The Consumer Price Index (CPI) for the Phoenix metropolitan area, on which these inflation measures are based, is prepared by the Bureau of Business and Economic Research, College of Business Administration, at Arizona State University. The quarterly CPI is based on comprehensive surveys conducted by the Bureau of Business and Economic Research in cooperative cosponsorship with Valley National Bank.

In the category of *Food,* Food at Home rose 3.1 percent in the fourth quarter, slightly less than in the third quarter but still higher than in the first half of 1980. Meats, Poultry, Fish, and Eggs (3.9 percent) and Dairy Products (3.8 percent) led the increase in Food at Home costs in the fourth quarter. Phoenix area Food at Home fourth quarter price increases compare unfavorably with the United States, Chicago, and Los Angeles-Long Beach averages of 2.3 percent, 2.1 percent, and 2.2 percent respectively. For the entire year, Food at Home increases in Phoenix are comparable to those of the comparison cities and the nation as a whole. Food Away From Home price increases in Phoenix in the fourth quarter (2.6 percent) were also slightly less than the rate of the third quarter. Food Away From Home costs have increased 15.6 percent since the fourth quarter of 1979, a rate exceeding that of most items of the CPI.

The price index for *Housing* increased 3.8 percent in the fourth quarter, up from the 2.5 percent increase of the third quarter. A major increase in contracted mortgage interest cost caused the index for the homeownership category to increase 7.0 percent. Home purchase prices rose less steeply at 2.8 percent. Residential rent continued to have another small increase, only 0.4 percent during the fourth quarter. A decrease in fuel and utility costs of 6.0 percent partially offset the large increase in homeownership costs. This decrease was due to a seasonal decrease in electricity rates, which dropped 18.9 percent from the third quarter.

The change in *Housing* from one year ago is 14.4 percent, comparing favorably with the Los Angeles-Long Beach increase of 16.9 percent and the Chicago increase of 19.4 percent, but higher than the United States figure of 13.7 percent. Most housing components in Phoenix had a smaller increase than the 14.4 percent; contracted mortgage interest costs were 40.6 percent higher than a year ago. These mortgage costs contributed one-fifth of the total 13.3 percent increase in the overall CPI from one year ago. The increases in other

housing items from one year ago are as follows: residential rent, 4.8 percent; home purchase, 10.4 percent; fuel and utilities, 5.9 percent; household furnishings and operations, 6.6 percent.

Apparel and Upkeep rose at a quarterly rate of 0.9 percent. Decreases in the cost of clothing were offset by increases in footwear (due to the many sales in the previous quarter) and in upkeep expenses such as laundry and dry cleaning. The 3.0 percentage change from a year ago is considerably below the change in the United States as a whole (7.6 percent), Chicago (5.1 percent), and Los Angeles-Long Beach (8.2 percent).

Transportation costs in the Phoenix area posted a 2.4 percent increase in the fourth quarter, up slightly from the previous quarter. The increase from a year ago of 13.1 percent is less than the rates of the nation as a whole (15.2 percent), and the comparison cities of Chicago (15.5 percent) and Los Angeles-Long Beach (13.7 percent). Private transportation in Phoenix increased 1.9 percent over last quarter, due largely to a 9.5 percent increase in new car prices. Other private transportation costs remained relatively stable, including gasoline costs and insurance costs. After large increases in the first quarter of 1980, private transportation costs increased only 2.7 percent the rest of the year. Public transportation costs, however, continued to increase rapidly with an 11.0 percent rise in the fourth quarter. This sharp increase in the fourth quarter is due to higher airline fares, intercity train fares, and taxi fares. Public transportation costs have increased 28.4 percent since the end of 1979.

Medical Care in the Phoenix area rose by 2.2 percent in the fourth quarter, a more moderate rise than the third quarter's 3.8 percent. The total increase during the past year was 11.3 percent, which is less than the change for Chicago (12.8 percent) and Los Angeles-Long Beach (12.5 percent), but greater than the change for the nation as a whole (10.7 percent).

Entertainment costs jumped 7.0 percent in the fourth quarter, a much higher rate than the third quarter's 2.3 percent. Higher costs for sporting goods and equipment, admission fees, and club and membership dues (due to seasonal factors) contributed to this fourth quarter increase. *Entertainment* costs in the Phoenix area have increased 20.6 percent since a year ago, about twice the rate of the United States (9.5 percent) and the comparison cities of Chicago (10.5 percent) and Los Angeles-Long Beach (9.7 percent).

The costs of *Other Goods and Services* rose by 3.6 percent during the fourth quarter, a somewhat higher rate than in the third quarter. Most of the items in this category increased in cost, led by tobacco products and smoking accessories.

Note: The complete Metropolitan Phoenix Consumer Price Index and the precentage changes for the United States and comparative cities are found on page 30.

METROPOLITAN PHOENIX CONSUMER PRICE INDEX
FOURTH QUARTER, 1980
(1969 = 100)

Group	*Third Quarter 1980 Index*	*Fourth Quarter 1980 Index*	*Percentage Change from Last Quarter*	*Percentage Change from One Year Ago*
ALL ITEMS	228.4	235.8	3.3	13.3
Food and Beverages	224.2	230.5	2.8	12.4
Food	229.7	236.5	3.0	12.6
Food at Home	240.7	248.2	3.1	11.1
Cereal and Bakery Products	236.2	241.0	2.0	10.6
Meats, Poultry, Fish, and Eggs	227.5	236.3	3.9	9.4
Dairy Products	207.6	215.6	3.8	8.8
Fruits and Vegetables	225.9	230.4	2.0	12.4
Other Food at Home	234.1	240.8	2.9	12.8
Food Away From Home	198.1	203.4	2.6	15.6
Alcoholic Beverages	153.1	154.1	0.6	10.8
Housing	228.2	236.9	3.8	14.4
Shelter	237.4	251.0	5.7	17.5
Rent, Residential	177.5	178.3	0.4	4.8
Homeownership	247.4	264.8	7.0	20.5
Fuel and Other Utilities	252.0	236.8	-6.0	5.9
Household Furnishings and Operations	187.9	191.7	2.0	6.6
Apparel and Upkeep	179.9	174.5	0.9	3.0
Apparel Commodities	164.3	164.1	-0.1	-0.8
Men's and Boys' Apparel	150.9	150.6	-0.2	3.6
Women's and Girls' Apparel	163.1	159.4	-2.3	-3.6
Footwear	190.7	201.4	5.6	-4.4
Transportation	242.6	248.4	2.4	13.1
Private Transportation	240.9	245.4	1.9	12.2
Public Transportation	270.0	299.6	11.0	28.4
Medical Care	310.4	317.3	2.2	11.3
Entertainment	189.1	202.2	7.0	20.6
Other Goods and Services	218.4	226.2	3.6	11.9
Personal Care	216.1	222.2	2.8	11.8

UNITED STATES AND COMPARATIVE CITIES

	United States		*Chicago*		*LA-Long Beach*	
Group	*Percentage Change From Last Quarter*	*Percentage Change From One Year Ago*	*Percentage Change From Last Quarter*	*Percentage Change From One Year Ago*	*Percentage Change From Last Quarter*	*Percentage Change From One Year Ago*
ALL ITEMS	2.7	12.6	6.0	15.1	3.3	14.0
Food	2.2	10.6	2.0	9.9	2.2	9.8
Food at Home	2.3	11.1	2.1	10.3	2.2	10.7
Food Away From Home	2.2	9.6	1.8	9.2	2.2	8.1
Housing	3.0	13.7	10.6	19.4	4.3	16.9
Shelter	4.0	15.2	15.6	23.1	5.4	18.3
Fuel & Utilities	-0.4	13.4	-3.7	12.8	-5.3	18.3
Household Furnishings & Operations	1.8	8.1	1.8	9.0	4.2	8.6
Apparel and Upkeep	3.5	7.6	2.1	5.1	1.8	8.2
Transportation	2.5	15.2	2.8	15.5	2.6	13.7
Medical Care	2.3	10.7	0.5	12.8	2.7	12.5
Entertainment	1.5	9.5	1.8	10.5	2.0	9.7
Other Goods and Services	3.9	9.8	5.1	10.6	2.9	11.5

Source: Metropolitan Phoenix data compiled by the Bureau of Business and Economic Research, College of Business Administration, Arizona State University; other data from U.S. Department of Labor, Bureau of Labor Statistics, Washington, D.C.

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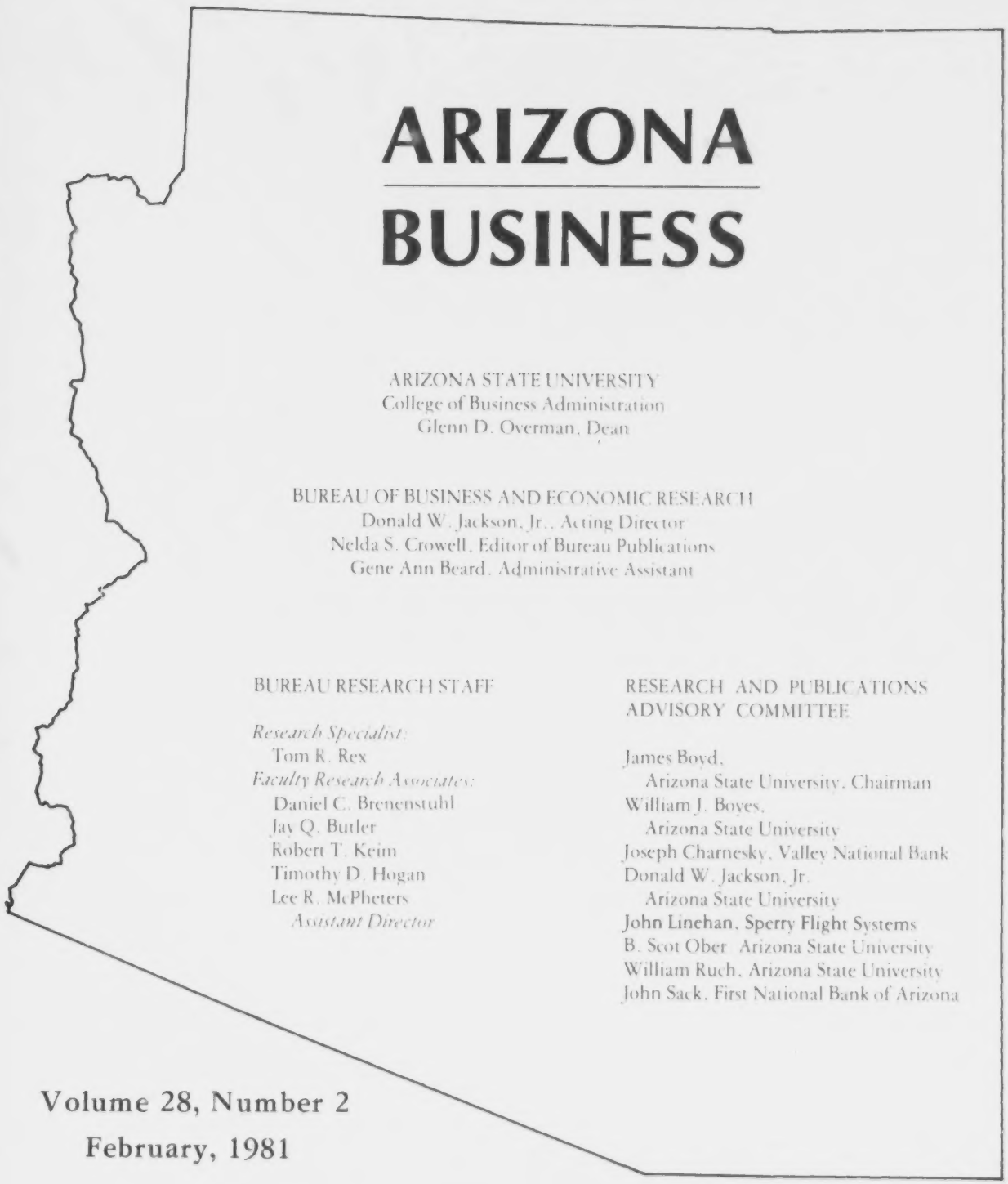

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Report To The Reader

One of the most widely discussed topics in today's business world is productivity. Because of this high interest, the feature articles in this issue of *Arizona Business* are devoted to several aspects of the problem of productivity.

The first article, "Declining Productivity: Trends and Causes," by Dr. George Bohlander is an overview, which shows that the problem is not simple nor is it easily solved. Just finding consistent data posed problems for the author. Nevertheless, American productivity is declining. "Strong productivity growth is a fundamental contributor to a rising standard of living, increased employment and higher real wages, strong international competitiveness, and improved business profits," says Dr. Bohlander. "The United States . . . has had no clear policy for directing economic development . . . . Perhaps now is the time to formulate that national framework."

Dr. William Werther deals with the people aspect of productivity in his article, "Productivity Improvement through People." He discusses the concept of employee involvement, which teaches nonmanagement employees to be problem solvers. Techniques such as quality circles, team-building, and suggestion systems can be useful. According to Dr. Werther, "Even the most competent and capable managers must seek the good ideas of their employees."

In his article, "Productivity Measurement," Dr. William Ruch addresses the problem of measuring productivity. For those seeking a comprehensive measurement system, Dr. Ruch outlines computations that yield productivity ratios as well as price recovery ratios. "The two total measures of productivity and price recovery give a good overall evaluation of the success of the firm — far better than profit or return on assets alone," he says.

As further evidence of the prominence of the topic, this year's Town Hall of Business sponsored by Beta Gamma Sigma business honorary will discuss a recent article on productivity. The Town Hall will be held on March 27 from 4:00 to 5:30 p.m. at the Fiesta Inn. The article to be discussed appeared in the October 21, 1981 issue of the *Wall Street Journal* under the heading "Many Culprits Named in National Slowdown of Productivity Gains." For further information, contact Dr. Louis Grossman, at Arizona State University, 965-6216 or 965-3431.

Declining Productivity: Trends and Causes

GEORGE W. BOHLANDER

Consider these facts: American factories are closing at an alarming rate. Recently a Ford plant in Mahwah, New Jersey and U.S. Steel mills in Youngstown, Ohio and Pittsburgh, Pennsylvania were closed, never to reopen. America continues to lose its share of international trade as the competitive advantage once maintained by American industry erodes. During the decade of the 1970s, total American industry lost 23 percent of its share of world market trade. In 1979, based on units sold, foreign auto producers captured nearly 30 percent of the United States market. Automobile imports were negligible in 1960 and represented about 15 percent of total United States auto sales in 1970. Furthermore, our decay in world markets occurred during a period of dollar devaluation, which made American exports cheaper and foreign imports more expensive.

Although American productivity showed consistent growth through 1967, it has since slowed and even declined. Six major factors are generally cited as causing today's productivity lag in the United States: reduced capital investment, slowed technological innovation, changing labor force characteristics, intersectoral labor shifts, government regulations, and a decline in the growth rate of the GNP.

George W. Bohlander is a faculty member in the Department of Management, College of Business Administration, Arizona State University.

In 1980 the United States standard of living ranked fifth among the industrial nations of the world; yet as recently as 1972, the nation's living standard was the highest among the developed nations. The United States inflation rate in 1979 was higher than the average of all industrial countries for the first time in history,[1] and high annual inflation rates continue, generally outstripping yearly wage gains. The result is a loss of "real wages" to workers, rising unemployment, and increased social welfare costs.

This list of American social and industrial ills is not exhaustive and could be expanded to include shrinking real corporate profits, a declining growth rate for real gross national product (GNP), soaring energy prices, and fluctuating but upward pressure on interest rates. Economic and business authorities generally cite the continuing decline in the United States productivity as the primary culprit in these problems. The Council of Economic Advisors to the President described the slowdown in productivity growth as one of the most significant economic problems in recent years, and productivity growth is seen as fundamental in reversing the problems noted previously.

Thus, it is not surprising that improved economic growth has achieved national awareness. Productivity centers have emerged;[2] Congress has held hearings on the subject; the President has appointed a commission on productivity; and economists have studied the issue with increased interest. Unfortunately, knowledge

about many aspects of productivity is still largely untapped. The field abounds with misunderstandings, conflicting statistics, and various prescriptions to cure the illness.

The purpose of this article is to synthesize recent reports and statistics highlighting the American productivity problem. Included here is a definition of productivity and productivity trends. The second section focuses on various factors affecting industrial growth or decline, and the article concludes by discussing future productivity growth rates and prospects for improvement.

PRODUCTIVITY DEFINED AND MEASURED

Many of the misunderstandings about productivity begin with its definition. For example, it has been described by top executives as synonymous with higher profits, increased return on assets, or other financial figures. Middle managers frequently associate the term with the increased production of goods or services, while workers or union officials define productivity as working harder, the "speed up," employment layoffs, or more work for less pay. Others confuse "productivity" with "production," which means more and more goods, suggesting wasteful consumption of scarce resources. To the general public, productivity is an instrument for increasing wealth and leisure, thereby improving the material well-being of the population. To each of these groups, the term elicits strong emotional appeals grounded in personal and organizational needs. While productivity improvements may cause all — or none — of these views, the misconceptions in defining the term produce conflicting goals for productivity improvement at both the national and organizational level.

In economic parlance, productivity is simply the relationship between the amount of goods or services produced (output) and one or more inputs (capital, materials, labor, etc.) used to produce that output: automobiles made per man-hour, claims processed per week, tires repaired per workday, or tons produced per BTU. In aggregate terms, *total factor productivity* relates all goods and services produced to all resources used to produce those goods or services. To determine productivity gains (losses), the productivity ratio of output to input is compared over a time period — monthly, quarterly, or yearly.[3] Measurements are normally expressed in constant as opposed to current dollars and are often characterized as "real." Productivity is higher or has improved when the same amount of input produces more goods or services or higher quality goods or services, or when the same amount of output can be produced with less input.

While the concept of productivity is deceptively simple, the measurement of productivity is extremely complex. Some of the problems rest in defining outputs and inputs, and in terms of measurement accuracy and concept.[4] For example, quantifying outputs in the service sector is a continuing problem since the product is often intangible and difficult to measure. Also, few organizations produce only one product or service. Where a single process produces more than one product, aggregating these products or services into a single measure of output requires a weighting system to represent the importance of individual components in a unit of output.[5] Problems in measuring input occur when more than one input contributes to the final goods or service produced. Output changes are attributable to different input variables including changing technology, improved production techniques, labor skill and knowledge, and quality of the work environment. Increases in productivity are more correctly viewed as savings in the labor input resulting from the combined effect of all inputs and the way they are utilized in the production of output. Productivity ratios, however, are usually based on output relative to a single (i.e., partial) input. When output changes, the tacit assumption is that the change is caused by the single input measured, which may or may not be true.

Although many different productivity measures are calculated, the relationship most frequently encountered relates output to unit of labor input. At the national level, the figure normally cited is the Bureau of Labor Statistics (BLS) measure of output per hour of all employed persons in the private sector. the BLS productivity measure includes the private service sector but excludes all levels of government. It should be noted that labor productivity simply indicates how much labor time is associated with a given volume of output. It does not measure changes in the efficiency of labor.

With today's emphasis on productivity improvement, the measurement of productivity is becoming increasingly important. As we enter the 1980s, we can expect the proliferation of new productivity ratios, including increased emphasis on "total factor" productivity. Input partials such as energy, capital, and materials will receive heightened attention along with our traditional measure — labor. An organization wishing to improve total productivity performance will define and measure the gains and trade offs of partial productivity ratios in order to achieve optimum performance.

UNITED STATES PRODUCTIVITY TRENDS

Perhaps the single best index of a nation's vitality is its productivity performance. The ability to produce more in less time and with fewer resources contributes to a steadily rising standard of living, creates new jobs, and provides greater amounts and varieties of goods and services.

Growth

The economic growth of the United States has rested largely on the country's ability to demonstrate consistent productivity improvement over many years. John Kendrick, an expert on productivity growth, notes that while output per labor input has fluctuated since 1800, it has remained constantly positive.[6] Over the years 1800 to 1855, output per worker grew at a rate of 0.5 percent per year. Between 1855 and 1900, average annual productivity increased by 1.1 percent, and labor productivity grew by approximately 2.0 percent annually between 1900 and 1920. Despite the Great Depression, the nation's productivity increased by 2.2 percent annually between 1920 and 1948.

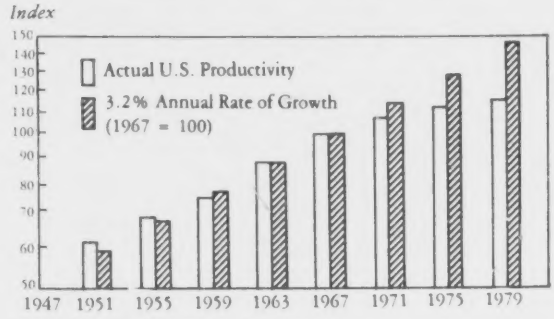
Figure I shows the progress of labor productivity in the American business economy for the years 1947 through 1979. A prominent characteristic of the figure is the significant 3.2 percent average annual rate of growth between 1947 and 1967. During this period an annual productivity improvement of 3.2 percent became regarded as normal growth and was adopted as a noninflationary guidepost for union wage negotiations.[7]

Decline

Beginning in 1968 the nation's average rate of economic growth began slipping. Average productivity declined to 2.1 percent per year between 1967 and 1973 and to 0.6 percent for the years 1973 to 1979. The data for 1978 and 1979 are particularly disturbing. In 1978 productivity grew by only 0.5 percent; in 1979 productivity actually declined by 0.9 percent. This faltering productivity growth rate between 1968 and 1979 significantly affected the American economy. Had the American productivity growth of 3.2 percent for the 1947-1967 interval continued through 1979, the 1979 index of 118.1 (Figure I) would have risen 27.6 points to 145.7. This economic growth would have represented an increase in the gross national product of $348 billion greater than the actual output of 1979.[8] While

FIGURE I

COMPARISON OF ACTUAL PRODUCTIVITY GROWTH TO 3.2 PERCENT AVERAGE ANNUAL GROWTH, 1947-1979
(Private Sector Employment Output Per Hour)



Source: U.S. Bureau of Labor Statistics.

1980 productivity figures are not yet available, preliminary estimates indicate that productivity will again decline by approximately 0.5 percent.

Aggregate national figures mask productivity figures for individual industries. Lester Thurow, analyzing productivity trends for twelve types of private industries accounting for 86 percent of GNP, showed that productivity declines were pervasive for all twelve industries.[9] However, over the 1948-1977 period studied by Thurow, the industries incurred varying degrees of decline over disaggregated time spans (see Table 1). For the latest period reported, 1972-1977, three of the twelve industries (mining, construction, wholesale trade) actually experienced negative rates of productivity growth, while another three industries (electric, gas, and sanitary services; retail trade; and services) had growth figures below the 1.2 percent five-year average. The only industry to experience an accelerated productivity growth rate between 1972 and 1977 was communications.

Despite these gloomy figures, the United States still remains the most productive nation in the world. American employees produce more per hour than their foreign counterparts based on the U.S. level of real gross national product per employee. However, other nations are fast closing this competitive edge, particularly Japan, West Germany, and France. For example, in 1978 the average Japanese worker produced approximately 63 percent as much as an American worker; in Germany and France 85 percent. Based on projections by the American Productivity Center, by 1990 the out-

TABLE 1

RATES OF PRODUCTIVITY GROWTH

	1948-65	*1965-72*	*1972-77*
Agriculture, forestry, fisheries	5.0	4.1	2.4
Mining	4.3	2.4	-5.1
Construction	3.4	-1.8	-0.8
Nondurable goods, manufacturing	3.3	3.2	2.6
Durable goods, manufacturing	2.8	2.3	1.3
Transportation	3.1	2.4	2.1
Communications	5.4	4.5	6.5
Electricity, gas, and sanitary services	6.3	3.4	1.0
Wholesale trade	3.2	4.0	-0.1
Retail trade	2.6	1.8	1.0
Finance, insurance and real estate	2.0	0.8	1.4
Services	1.2	1.6	0.2
Average	3.3	2.3	1.2

Source: Lester C. Thurow, "The U.S. Productivity Problem," *Data Resources U.S. Review*, August 1979, reported by Eli Shapiro, *Policies for Productivity Growth* (The American College, Bryn Mawr, Pennsylvania, 1979), pp. 7-8.

put of Japanese workers will almost equal that of American employees, while German and French workers will exceed American workers by approximately 15 percent.[10]

INTERNATIONAL COMPARISONS

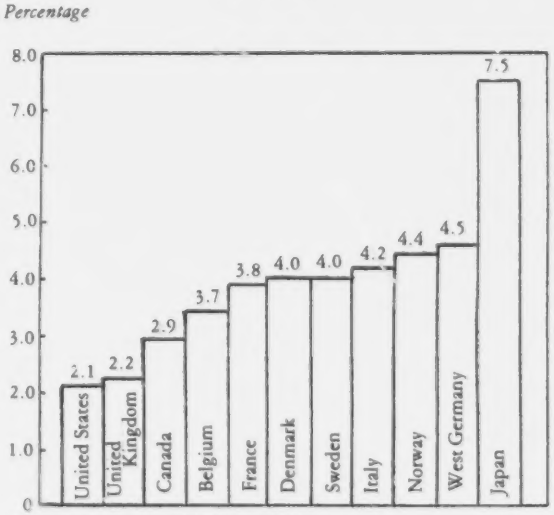
Deteriorating United States productivity is magnified when contrasted with the growing economies of the major industrial nations of the world. America's productivity slippage in the world arena is significant since it contributes to our high inflation rate and our decline in international trade competitiveness. As a share of world trade, United States exports dropped from 21 percent in 1957 to 12 percent in 1979 at a time when United States total world imports continued to rise. As a percentage of GNP, American total imports accounted for 9.3 percent of total GNP in 1979, a figure substantially above the 1978 level of 8.6 percent. American decline in international competitiveness represents billions in lost production and the loss of thousands of industrial jobs.

Figure II compares the United States average annual productivity growth rate to ten industrial countries for the years 1950 through 1978. Over this twenty-eight year period, the average annual rate of growth for the eleven countries equaled 3.9 percent. Six countries exceeded this economic growth rate (Denmark, Sweden, Italy, Norway, West Germany, Japan) while five nations had growth rates below this figure (the United States, Britain, Canada, Belgium, France). The average annual productivity growth for the United States was 2.1 percent, well below the 3.9 average annual rate and the lowest productivity growth rate of the eleven nations. During 1950-1978, three countries (Italy, Norway, West Germany) actually doubled the United States growth rate while Japan more than tripled the percentage.

In reality, cyclical growth rates have been significant for the countries listed in Figure II. For example, the United States rode the post-World War II productivity growth wave for twenty years (1947-1967) before experiencing deteriorating growth rates between 1965-1973. Japan and Italy actually increased their rates of productivity during the 1965-1973 period, while France and Germany maintained very high rates of improvement.[11] The industrial growth for all countries declined badly following the 1973 oil embargo by the Organization of Petroleum Exporting Countries (OPEC) and the worldwide recession of 1973-1978. Between 1973 and 1978,

FIGURE II

AVERAGE ANNUAL PRODUCTIVITY GROWTH
Output per Employee Hour
1950-1978



Source: U.S. Bureau of Labor Statistics.

Japan's average annual growth fell to 3.1 percent, and West Germany's fell to 3.2 percent. The decline experienced earlier in the United States, Britain, and Canada continued, with these countries registering marginal growth rates of 0.4 percent, 0.9 percent, and 0.8 percent for the 1973-1978 period. Statistics from the Organization for Economic Cooperation and Development (OECD) for 1979 show productivity growth rates of 3 percent for France, 3.5 percent for Germany, and 4.5 percent for Japan, a sharp contrast to the approximately 1 percent productivity decline experienced in the United States. Estimates from the Economic Report of the President and OECD predict that in 1980 the United States will show a growth decline of 0.5 percent, Canada will experience no growth, Japan will increase productivity by 4.5 percent, and France and Germany will grow by 3.0 percent and 3.5 percent respectively.[12]

One of the remarkable features of the world economy has been the productivity performance of Japan, which in the past twenty-five years has grown from a modest GNP with low levels of output per worker and productivity to the third largest GNP in the world.[13] Factors contributing to Japan's rapid development include a unique government-business relationship, a high level of capital investment, encouragement of high technology industries, emphasis on rapid growth over short-term profits, and a unique employee-management relationship combined with culture-specific characteristics of the country.[14] The wide gaps in productivity growth trends between the United States and Japan are also due to the reindustrialization of war-torn industries with modern technology aided by American financial support and technical and managerial knowledge. Although Japanese growth has slowed since the petroleum cartel of 1973 and the quantum increases in oil prices, Japan is expected to continue developing at a sharp pace but below the 7.5 percent average annual rate of 1950-1978.

CAUSES OF LAGGING PRODUCTIVITY

America's productivity decline has been attributed to a great many factors. While researchers have recognized as many as fifteen variables affecting economic growth, six major factors are generally cited as causing today's productivity lag: reduced capital investment, slowed technological innovation, changing labor force characteristics, intersectoral labor shifts, government regulations, and slowing national economic growth. Since these variables interact concurrently, there is no general agreement about the quantitative effects of each variable on overall productivity decline.

Capital Investment

Productivity experts agree that a major contributor to long-term economic growth is capital expenditures. Growth in capital stock at a rate faster than growth in labor (i.e., the capital/labor ratio) is critical for technological progress and a growing GNP. The output of workers rises when new technology replaces old equipment and workers have both more and better capital facilities. While adding to existing productive capacity, capital investment further contributes to technological innovation through expenditures on research and development.

Capital investment in the United States increased rapidly in the 1960s, but slowed dramatically during the past decade. The average annual percentage increase for private, nonresidential fixed investment reached a peak of 4.7 percent between 1957-1969, following World War II. For the ten-year period 1969-1979, capital investment outlays declined to an average annual increase of only 2.7 percent.[15] It is significant that as a percentage of total capital investment industrial machinery accounted for 12 percent of capital acquisitions in 1979; twenty years earlier this category reflected 20 percent of total spending.

The effects of lower capital spending on productivity can be demonstrated through the relationship between the capital/labor ratio and economic growth. Figure III illustrates this connection. Lower investment in capital stock has, in recent years, translated into shrinkage in the ratio. This, in turn, contributed greatly to the nation's loss of productivity growth after 1977. According to the American Productivity Center:

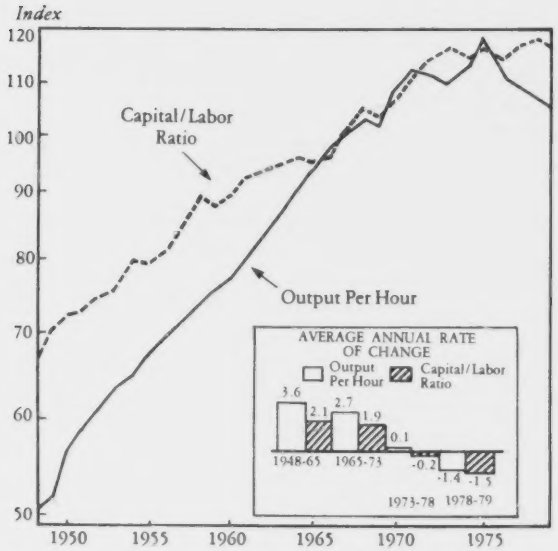
> During the span 1948-1965, capital stock per worker grew at an annual rate of about 2.0 percent per year. It continued to drop with increasing sharpness during the past 15 years of inflation at 0.9 percent per year during 1965-1979. It should be noted that the capital stock per worker dropped an average of almost 2.0 percent per year during 1977, 1978 and 1979, as business investments rose only slightly.[16]

Concomitant with inadequate investment in productive facilities has been the substitution of labor for risky and expensive new plants and equipment. The capital/labor ratio shrank when rising energy costs and environmental regulations made energy-using capital very expensive to operate. The response by business has been to utilize a readily available supply of relatively cheaper, but less productive, labor for technical advances.

Adjusting for cyclical business fluctuations, the United States has invested a stable 10 to 11 percent of

FIGURE III

TRENDS IN OUTPUT PER HOUR AND CAPITAL/LABOR RATIO, 1948-1979
(Private Business Sector)
1967 = 100



Source: Productivity Perspectives, American Productivity Center, 1980.

GNP in capital stock between 1960 and 1978, while other countries have invested larger shares of their national output on capital formation. For the period 1960 to 1978, average fixed capital investment as a percent of gross domestic product (GDP) for Japan was 27.5 percent; West Germany, 19.4 percent; Italy, 16.3 percent; France, 19.2 percent; Canada, 19.7 percent; and the United Kingdom, 17.0 percent.[17] The importance of investment spending as a percentage of GDP is shown in Figure IV which demonstrates the positive correlation between this measure and the annual increase in productivity among countries.

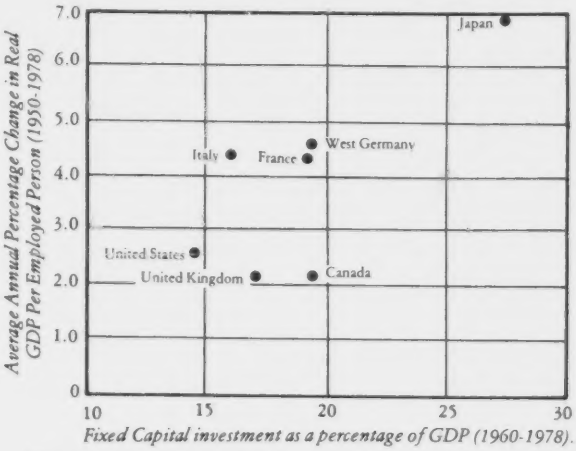
Technological Innovation

Researchers frequently cite advances in technological knowledge as the largest single factor accounting for productivity growth. Clearly, a positive correlation exists between industrial research and development outlays (R&D), growth of capital and economic development. Research and development is the primary source for advances in scientific and technical knowledge while contributing to the introduction of new products for commercialization. It is principally through R&D expenditures that more efficient and less costly equipment is applied to production processes, thus contributing to long-term productivity growth.

A disturbing aspect of the United States economic decline is a slowing of R&D expenditures. Total research and development spending as a percent of GNP has declined from a high of 3 percent in 1964 to a low of 2.2 percent in 1978 (Figure V). From 1961 to 1967, total R&D outlays (in constant noninflated 1972 dollars) increased at the rate of 5.85 percent per year. The United States annual average declined to a scant 0.6 percent for the years 1968 through 1978. More important, American spending on R&D as a percentage of sales in such research intensive industries as machinery, professional and scientific instruments, chemicals, and aircraft had dropped by the mid-1970s to about half its level in the early 1960s.[18] Projections from the National Science Foundation expect total R&D expenditures to rise 3 percent a year through 1985, although R&D spending as a share of GNP may decline to 2 percent.[19] Since it takes approximately ten to fifteen years for an idea to develop into an application for improved productivity, the recent decline in R&D funds is likely to have lasting effects well into the 1980s.

FIGURE IV

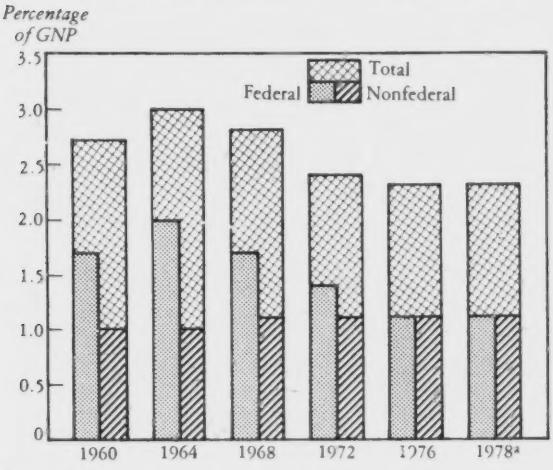
INTERNATIONAL COMPARISON OF PRODUCTIVITY CHANGE[1] IN RELATION TO BUSINESS INVESTMENT



[1]Change in gross domestic product per employed person, using country's own price weights.
Source: U.S. Bureau of Labor Statistics.

FIGURE V

NATIONAL R&D EXPENDITURES
AS PERCENTAGE OF GNP
(By Source, Selected Years, 1960-1978)



[a]Estimated
Source: National Science Foundation

A feature of modern American research and development expenditures is the emphasis placed on short-term applied technology rather than long-term basic research. Between 1960 and 1974, industry cut basic research funding in half from 8 percent to 4 percent where it remained through 1979.[20] During this period of high inflation and uncertainty, industry has intentionally directed R&D spending toward low-risk, small-scale projects providing fast dollar return. Conversely, there has been a reluctance to invest in more risky, fundamental technology with long-term payouts and greater opportunities for productivity growth. Compounding this trend is the encroachment of government regulations into R&D budgets. Determining methods to meet federal requirements has been a significant R&D cost since the technology needed to comply with government mandates has often been nonexistent.

While American expenditures for R&D have declined as a percent of GNP since the mid-1960s, comparative data show other nations increasing their R&D outlays. Both Japan and West Germany — leading nations in average annual productivity improvement — have devoted increasing shares of their gross national product to technological development. This international trend occurs at a time when foreign investors have received an increasing proportion of United States patents. In 1961, foreign inventors were issued 17 percent of all American patent grants; by 1978 this figure increased to 38 percent. While these figures may not signal a decline in relative inventiveness, they may exert a long-term productivity decline upon the capability of United States industry to reap benefits from new inventions.[21]

Labor Force Characteristics

A commonly cited reason for lagging growth — although one hard to quantify in precise terms — is the emergence of new employee attitudes toward work. It is noted that since the counterculture movement of the mid-1960s there has been a deterioration in the work ethic characterized by lack of ingenuity, poor quality workmanship, rising absenteeism and turnover, and loss of motivation, although this is a controversial possible cause of declining productivity. Furthermore, a prevalent feeling of "me-ism" contributes to erosion of workplace discipline and rebellion against the establishment. These charges are leveled mainly against blue collar workers, although they are ascribed to white collar workers, including managers and professional employees, with increasing frequency. Negative attitudes are caused by a decline in the desire to improve one's standard of life and occupational position principally through rewards based on individual effort and achievement. In the affluent society, workers harbor the notion of entitlement fostered by feelings of social and economic equality.

Others argue that while work disenchantment exists, the cause is found in the *type* and *kind* of work available, not in working itself. With continually rising expectations, workers desire jobs that provide challenge and interest — jobs able to fulfill the personal needs of esteem, recognition, and growth. If the work ethic has declined, the answer is found in dull, repetitive jobs underutilizing the talents of an increasingly educated work force.

Economists agree that the economic decline has been caused, in part, by structural changes in the age-sex composition of the labor force. The age profile of the labor force changed considerably between 1966 and 1973 when the baby boom children of the 1940s and 1950s entered civilian employment. This disproportionately large influx of young workers was considered a drag on productivity because they possessed low levels of industrial skill and experience. This occurred during a period when older, more experienced men withdrew from working, partly because of early retirement. Combined with these counterproductive trends was the en-

trance of large numbers of women into the labor force. Handicapped by inexperience and by the lack of opportunity for upward occupational mobility, women tended to cluster into low paying, low productive jobs.

However, the age-sex composition of the work force stabilized during the years 1973 to 1979 and cannot be blamed for the 1979-1980 productivity decline. The number of young people entering the work force slowed considerably after 1973 while the entrants of 1966-1973 acquired the skills and experience needed to be productive. In fact, recent structural changes in the labor force were considered a plus for productivity growth in 1979 and 1980. During the decade of the 1980s, the work force will continue to age while the opportunities for women may improve, affording more productive jobs to this group.

Intersectoral Labor Shifts

National productivity figures are greatly affected by shifts of labor among different sectors of the business economy. This occurs largely because different industries or sectors have higher output rates than others. For example, a large factor in the 3.2 percent average annual economic growth of the United States between 1947 and 1967 was the movement of labor from agriculture — with its low levels of output per hour — to more productive occupations in manufacturing. This twenty-year intersectoral shift contributed an average of 0.5 percent a year to the economic growth rate of the economy as a whole.[22] With only 0.5 percent of the work force in farming today, the shift out of agriculture has virtually stopped and, therefore, the present gains from this movement are largely negligible.

Productivity experts widely suggest that the slowdown in productivity growth is partly due to the structural shift in employment to the rapidly growing service sector. Over the past six years, more than 90 percent of employment growth has been in the service-producing organizations. Service organizations are alleged to lower national productivity growth due to the intangible nature of personal services and the labor intensity of service organizations. To date, the ability to substitute large quantities of capital for labor has not existed. Technology does play a role in service facilities but a relatively small one compared to its role in manufacturing.

It should be noted, however, that economists argue over the degree to which the service sector has contributed to economic decline. The arguments are based on two premises: First, the measurement of service output is fraught with weaknesses and conceptual mistakes. Second, productivity measures evaluate output only and do not include the useful application of the services rendered. For example, productivity measures do not account for personal improvements in comfort, convenience, or time offered by service organizations. These measurement errors may well serve to exert a downward bias on the productivity of this sector. The Bureau of Labor Statistics estimates that the decline of economic growth due to the service sector has been small, accounting for less than 0.1 percent of the decline in overall productivity.[23]

Government Regulations

Government regulations frequently develop when business neglects to fulfill socially desirable goals. Laws governing equal employment opportunity, occupational safety and health, and industrial pollution were passed because of genuine concern for human rights and a better society. However, today's productivity lag is attributed partly to the negative impact these government rules and regulations have on business operations. Business people complain of a poorly managed regulatory system complete with jurisdictional overlaps, complicated and overly detailed reporting procedures, overbearing federal regulators, and nitpicking standards. The proliferation of governmental mandates results in substantially increased business costs contributing to higher national inflation. The argument is made that compliance with government regulations has approached a direct tax that diverts funds from productive capital formation and R&D spending.

The cost to business of complying with governmental rules is easily shown, although "estimates of dollar outlays vary widely because there is no commonly accepted method of computing either the cost of regulation or the benefits achieved."[24] A 1977 study by the *Business Roundtable* showed that forty-eight companies spent a total of $2.7 billion in order to comply with the regulations of six federal agencies. This amount was equivalent to 16 percent of net income (23 percent for the industrial firms) and 43 percent of R&D spending.[25] In 1978, all industries spent 4.5 percent of total capital expenditures for plant or equipment solely on pollution control. This was down from 5.1 percent in 1977 and 5.6 percent in 1976. Economist Murray L. Weidenbaum estimates that, on average, each dollar appropriated for government regulation imposes a twenty dollar additional cost on the business sector.

National Economic Growth

A substantial part of the recent slowdown in productivity growth is due to the decline in the rate of growth of real GNP. Table 2 illustrates the positive relationship between growing or declining gross national product and various characteristics of the economy. Of special significance is the correlation between declining growth rates for real GNP between recent periods (1973-1978 and 1978-1979) and lower total factor productivity and output per employee hour for these periods. The 1974-1975 recession sharply depressed output causing significant declines in productivity. A general economic tendency is for productivity to fall during contractions as capital utilization drops and employers, unsure of the seriousness of the decline, resist costly employment layoffs. If employment remains constant or rises, as it did in the 1973-1978 and 1978-1979 periods (Table 2), this only aggravates the downward trend of productivity growth.

Economists have traditionally noted that productivity growth is the force behind a noninflationary economy. That is, when productivity growth lags behind wage gains, inflation results as extra costs are added to the prices of goods and services. Recently, however, economists critical of the government's effect on productivity attribute the slowness in economic growth to high inflation caused by huge deficit spending. During the 1970s, federal government expenditures exceeded the tax base during both recession and recovery periods. With a limited money supply, government borrowing to repay the debt diverts funds needed for capital expansion and technological developments in the private sector. Furthermore, increases in the supply of money through the Federal Reserve System encourage inflation through a wage-price spiral, or vice versa, thus contributing to a self-fulfilling prophecy of rising inflation. Expectancies of inflation, in turn, distort investment spending, and the cycle deepens.

TABLE 2

DECLINING GROWTH RATES, 1948-1979
(Real GNP, National Income, Hours, Productivity, Employment, and Real Earnings)

Item	*Average Annual Percent of Change* 1948-73	1973-78	1978-79
Gross National Product	3.79	2.53	2.23
Employment	1.49	2.26	2.73
GNP per capita	2.30	1.73	1.42
GNP per employee	2.26	0.27	–0.43
National income per capita	2.18	1.36	
National income per hour worked	2.66	0.70	
Employment per capita	0.03	1.47	1.86
Hours worked per employee	–0.54	–0.55	3.2
Total-factor productivity (private domestic economy)	2.4	0.4	–0.5
Output per employee hour (private domestic economy)	3.0	1.0	–0.9
Real average hourly earnings	3.1	1.2	–1.7

Sources: Labor productivity: U.S. Bureau of Labor Statistics; National income data: E.F. Denison; Total factor productivity: American Productivity Center; Other series: *Economic Report of the President:* 1980; reported in *Productivity Perspectives,* American Productivity Center, 1980.

Any discussion linking productivity lags to gross national product and inflation must include the exceptional cost of energy. Higher energy costs have had, and will continue to have, a depressing effect on the productivity growth rate. The American Productivity Center describes the shock of energy costs on output this way:

> The revolution in energy prices that began with the OPEC petroleum boycott in 1973 has exerted an impact on productivity in ways that are not yet fully understood, nor are they directly traceable in any of the macro-economic models on sources of growth and reasons for the slowdown. However, it is increasingly obvious that the revolution in energy prices and the absolute and increasing shortages of energy supply are not only causing a substitution of labor for capital and energy but are also disrupting the whole process of technical change in the economy. The rise of energy prices has made energy-using capital and technical change obsolete so that productivity growth is being held in abeyance until the technical change process can adjust to the new pattern of factor prices.[26]

Other Causes

The six reasons discussed here as causing America's productivity problem are generally accepted by economists as the major underlying causes for the slowdown. The list is not all inclusive. The following are mentioned by others who have reviewed productivity lags.

- A continuing business-government-labor adversarial relationship.
- A decline in personal savings, which since World War II accounted for 65 percent of the nation's funds available for capital investment.

- A government system of tax codes that discourages investment.
- Deference to a market-driven strategy emphasizing marketing producible products rather than producing marketable products.[27]
- Emphasis on short-term business profits buttressed by compensation systems, management-by-objective goals, and financial requirements for investment projects.

PRODUCTIVITY GROWTH IN THE 1980s

Projections for long-term productivity growth are both encouraging and disquieting. On the plus side, most economists expect a moderate recovery during the 1980s, but average annual growth rates are not expected to reach the 3.2 percent improvement rate achieved in the 1947-1967 period. Modest recovery rates "generally" fall between 1.5 percent and 2.5 percent. Table 3 shows six different projections for the ten-year period 1980-1990 based on labor productivity plus Kendrick's estimate based on total factor productivity. The lowest labor productivity rate is 0.9 percent forecasted by William Freund for the New York Stock Exchange; the high rate, 3.4 percent, is offered by Kendrick. Kendrick's rate is based on strong economic growth coupled with restraints in federal spending. The projected productivity growth rates listed in Table 3 are consistent with those of other productivity experts including Siegel, Thurow, and Dennison.[28]

Forecasts for productivity gains in the United States are balanced among measurable influences affecting productivity growth plus assumptions assigned to less measured factors. Fortunately, some of the trends that slowed productivity growth in the 1970s may be temporary and self-correcting. Others, considered positive to productivity growth in the past, may have little or no effect on future growth rates. During the decade of the 1980s, the following are listed as potential contributors to productivity growth:

- Improvement in the capital/labor ratio as the labor force grows more slowly.
- A more experienced and skilled labor force.
- Advances in technological innovation embodied in new capital equipment.
- Improvements in managerial know-how and industrial practices.

Offsetting these gains, however, are:

- Continued expenditures to meet government standards including outlays for nonproductive investments for pollution control and for safety and health regulations.
- A continuation of the intersectoral shift from manufacturing to service.

TABLE 3

PROJECTIONS OF PRODUCTIVITY FOR PRIVATE BUSINESS ECONOMY, 1980-1990.

Source *Labor Productivity: Output per hour*	*Time Period*	*Projected Avg. Annual Percentage Change*	*Assumption*
Bureau of Labor Statistics	1980-85	1.9 to 2.1	—
	1985-90	2.3 to 2.5	—
Council of Economic Advisors	1980-82	1.0	—
	1982-85	1.5 to 2.0	—
Data Resources, Inc.	1979-85	1.5	—
	1986-90	1.9	—
	(1979-90)	1.7	—
Fortune Magazine (A. Greenspan)	1979-89	2.1	No economic upsets now evident
J.W. Kendrick	1980-90	2.1	Basic scenario
	1980-90	3.4	High-growth
New York Stock Exchange (William Freund)	1980-90	0.9	Low-investment
	1980-90	1.1	Base case
	1980-90	2.0	High-investment
Total Factor Productivity			
J.W. Kendrick	1980-90	1.6	Basic scenario
	1980-90	2.6	High-growth scenario

Source: U.S. Bureau of Labor Statistics, Data Resources, Inc., Fortune Inc., J.W. Kendrick, and New York Stock Exchange (Freund); reported in *Productivity Perspectives*, American Productivity Center, 1980.

- No further gains from farm-to-nonfarm occupations.
- A continuing rise in energy costs.

There is no general agreement on the exact quantitative effects of either the positive or negative factors.

SUMMARY AND CONCLUSION

The purpose of this article has been to review United States productivity trends and problems. Four major points can be drawn from this overview. Three of these points are readily deduced from the article; the fourth is more ambiguous and harder to discuss because of the controversies surrounding the issue.

The first prevalent feature of productivity is the critically important role it plays in the vitality of the United States. Strong productivity growth is a fundamental contributor to a rising standard of living, increased employment and higher real wages, strong

international competitiveness, reduced inflation, and improved business profits.

Second, largely due to the magnitude of the subject, productivity is an extremely complex topic. As a term, productivity is beset with misconceptions that confuse and often hinder policies to remedy the United States productivity problem. Furthermore, experts are not in agreement on how to measure productivity accurately or what to include in measurement statistics.

Third, the deterioration of United States productivity is now of national concern. Researchers have recently directed their attention to causes of the productivity decline. Study results list a gamut of depressants although six major causes are normally cited. These range from low capital spending and reduced R&D expenditures to worker attitudes and government regulations.

The fourth prominent point about productivity, and the one of immediate concern today, is what to do about the problem. However, it is in the area of correction that opinions diverge and even contradict one another. While experts may agree on methods to alleviate the problem, they may not agree on changes in public policy to achieve these goals. It is beyond the scope of this article to detail the numerous suggestions offered for improvements, but the following proposals are frequently heard.

Congress should formulate policies that would spur capital investment and R&D spending principally through revisions of current depreciation rules and liberalization of the investment tax credit. Closely allied with this suggestion are tax incentives to encourage personal savings in order to supply the resources necessary for capital formation. Additionally, government officials should reevaluate, and change when necessary, the myriad regulations adding to business costs. Where change is impossible, regulatory programs should be managed more efficiently and with less adversary and litigious intentions. Future and existing laws should be evaluated based on estimates of the costs and benefits to the public and business. Finally, experts agree on the need for federal budgetary constraints and improved monetary measures to curb inflation.

While these suggestions are valuable, it is important to recognize that economic improvements do not lend themselves to magical solutions. There are many determinants of productivity growth. The success of these presriptions, and others, may well rest on the ability of policy makers, in cooperation with labor and management, to fashion a long-term, cohesive national policy for productivity growth. With the current attention to our productivity record, perhaps now is the time to formulate that national framework.

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[1]"The Reindustrialization of America," *Business Week*, June 30, 1980, p. 57.

[2]Arizona State University formed a productivity institute in 1975. The institute is actively engaged in collecting national and regional productivity data. Information about the center can be obtained by writing to the Productivity Institute, College of Business Administration, Arizona State University, Tempe, Arizona 85281.

[3]For an expanded definition of productivity, see William A. Ruch and James C. Hershauer, *Factors Affecting Worker Productivity*, Occasional Paper Number 10 (Bureau of Business and Economic Research, College of Business Administration, Arizona State University, 1974), Chapter 2.

[4]*Ibid.*, p. 10.

[5]*Productivity in the Changing World of the 1980s* (National Center for Productivity and Quality of Working Life, Washington, D.C., 1978), p. vi.

[6]William Bowen, "Ailing Productivity," *Fortune*, December 3, 1979, p. 68.

[7]*Ibid.*, p. 68.

[8]*Productivity Perspectives* (American Productivity Center, Houston, Texas, 1980), p. 9.

[9]Eli Shapiro, *Policies for Productivity Growth* (The American College, Bryn Mawr, Pennsylvania, 1979), pp. 7-8.

[10]*Productivity Perspectives*, Table A42, p. 60.

[11]Ibid. p. 36.

[12]Ibid. p. 60

[13]*The Future of Productivity* (National Center for Productivity and Quality of Working Life, Washington, D.C., 1977), p. 79.

[14]For an expanded treatment of Japanese productivity growth, see *Industrial Growth in Japan*, prepared by Marlene Shaughnessy, Information Services, American Productivity Center, Houston, Texas, September 1979.

[15]"Capital Investment in Perspective," *Economic Road Maps*, Nos. 1886-1887, The Conference Board (September 1980), p.1. Outlays in constant (1972) prices.

[16]*Productivity Perspectives*, p. 29.

[17]"Capital Investment in Perspective," p. 4.

[18]Robert H. Hayes and William J. Abernathy, "Managing Our Way to Economic Decline," *Harvard Business Review* (July-August 1980), p. 69.

[19]*Productivity in the Changing World of the 1980s*, p. 27.

[20]"Business Week's R&D Scoreboard: 1979," *Business Week*, July 7, 1980. pp. 47-48.

[21]*Productivity Perspectives*, p. 43.

[22]*Productivity in the Changing World of the 1980s*, p. 19.

[23]*Ibid.*, p. 19.

[24]"The Reindustrialization of America," p. 66.

[25]Statistics for this study were reported in *Business Week*, June 30, 1980, p. 66.

[26]*Productivity Perspectives*, p. 31.

[27]"Managing Our Way to Economic Decline," p. 71.

[28]The projections of Siegel and Thurow are reported in "Policies for Productivity Growth," footnote 9. Dennison's estimates are from *A Summary of the Future of Productivity* (National Center for Productivity and Quality of Working Life, Washington, D.C., 1977), p. 3.

Productivity Improvement Through People

WILLIAM B. WERTHER, JR.

An important question facing business today is, What can individual managers and employees do about the productivity crisis? Since low productivity growth rates are a national problem, many people conclude that solutions must be national in scope. A review of the causes of the productivity dilemma listed in Table 1 appears to reinforce the idea that no one individual manager or employee can alter the course of current productivity trends. Each factor in the table seems to require government action or fundamental changes in our culture. Since these requirements are outside the scope of any one individual, managers and workers often feel absolved of any need for action.

Nevertheless, ongoing productivity gains have been achieved by individual workers, managers, firms, and industries in the United States. These gains represent only partial solutions to our national crisis, but the cumulative effect of these gains — if extended to more organizations — can alter the productivity of the nation.

Substantial productivity gains can be achieved through employee involvement in which nonmanagement employees are allowed to solve problems that affect their job performance, job setting, and the job itself.

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TABLE 1

COMMON CAUSES OF SLOW PRODUCTIVITY GROWTH

- Government regulations, taxes and high interest rates
- Few business and individual incentives
- Slow capital formation and outdated industrial base
- Insufficient research and development expenditures
- Poor attitudes toward work in the workforce
- Adversary labor-management attitudes and values
- Improper mix of skills among workers
- Large and growing service and government sectors
- Resource shortages and high energy prices
- Inflation
- Foreign competition

Source: Developed by the author.

Through employee involvement, companies such as Texas Instruments, IBM, Lockheed, Northrup, Control Data, Tektronix, General Motors, Beech Aircraft, Champion International, Solar Turbines, Bendix, and others have achieved substantial productivity gains.[1] Each of these companies has reported returns of 200, 300, and 400 percent from their investments involving employees in work place decisions.

EMPLOYEE INVOLVEMENT: THE CONCEPT

The key to successful employee involvement is allowing nonmanagement employees to solve prob-

lems that affect their job performance, job setting, and the job itself. Although management retains the authority to decide if employee ideas will be used, management challenges workers to uncover problems and make recommendations for improvement. The challenge may be focused on lowering costs, reducing defects, improving safety, increasing output; or it may be unfocused with the object of challenging the workers to find easier ways to do their job.

The challenge usually is delivered to the workers through training programs that teach employees how to be problem solvers. Training includes topics ranging from data collection and analysis techniques, to problem solving and presentation skills. Since employees are taught the need for analytical solutions that are justified by facts not feelings, recommendations to management are accompanied by businesslike justifications. Interestingly, demands for wage and benefit increases or other cost increases seldom arise from these groups unless accompanied by documentation and justification. Instead, solutions usually recommend changes that contribute to improved job performance.

As part of employee involvement, management usually allows employees time during work hours to apply these concepts — individually or in groups — to elements of the job and job setting that need improvement. Although management may suggest areas of consideration, employees are usually free to select the issues that interest them. When employees are free to select the work-related problems that concern them, they appear more interested in finding solutions. Since their solutions are achieved participatively, their commitment is higher and their resistance to the change is lower.

Problems with Involvement

If employee involvement benefits employers and workers, why has it not been used by more companies? Although the problem is very complex, the answer to this question lies partly in some fundamental assumptions and perspectives of many American managers.

Too often managers view their employees as less educated, less motivated, and less dedicated than themselves. Many managers assume their workers are apathetic and treat them accordingly. Feedback is often limited to discipline with too little recognition for good performance. Management reports are seldom widely shared with employees, and sometimes, not even with first level supervisors. Glossy stockholder reports go to investors who may be far removed from the workplace, but employees may not know last week's productivity performance in their department. High scrap rates, absenteeism, and defective units are produced partly because many workers are not educated by management to be businessmen and businesswomen.

Another problem is the short perspective found among many managers and chief executive officers (CEOs). Unrelenting pressure is applied to achieve short-term goals, which for managers means meeting budgets, and for CEOs means ever increasing quarterly earnings per share growth. Short-run expedience is substituted for sound business judgment in such cases. A simple example illustrates the point: No manager would consider spending $12,000 for a word processor without training the operator how to run the machine. Yet, even some supposedly well-managed firms promote workers into supervision without a single minute of supervisory training. A hearty handshake, a pat on the back, and an offer of help if needed constitute the typical orientation and training program for the elated, but often bewildered, new supervisor. Yet, this supervisor may manage a payroll of hundreds of thousands of dollars and workers who actually produce the firm's products or services.

An extension of the apathetic assumption and the short-run perspective also affects employee involvement efforts. Many top and middle managers are reluctant to make the necessary "investment" in supervisory and employee training programs that should precede a major employee involvement effort. For example, Solar Turbine, Inc. (a San Diego based subsidiary of International Harvester, Inc.) invested $79,000 in its involvement program during the first eighteen months. This type of up-front investment is less clearly measured, however, than investments in plant, equipment, advertising, or other claimants on organizational budgets. Even when the "investment" in people is made, the rate of return is difficult to measure and is easily curtailed in times of high interest rates and limited budgets.

When top management is committed to employee involvement, concern is often expressed over the voluntary aspects of involvement programs. Voluntarism is another concept foreign to operating managers who believe their job is to solve problems and make decisions. Allowing employees the autonomy to select problems they wish to solve may be seen by managers as an abdication of their responsibility or even a threat to their authority. Often supervisors and middle managers require training to understand their role in the organization, which is not so much to make decisions or to

solve problems, but to get decisions made and problems solved.

Once managers accept their role as managers, not doers, the feelings of abdication and threat subside. They are then better able to turn their attention to the planning, organizing, directing, staffing, and controlling that are the core functions of management. In the managerial capacity, they remain responsible for meeting objectives. When pressing problems arise that employees do not wish to tackle or are unable to solve, managers must then intervene through delegation or hands-on activities. Although employee involvement means extensive participation by employees in problem-solving areas traditionally reserved for management, it does not mean an abdication of management's responsibility for results. Instead, it means sharing the need-satisfying aspects of work.

PRODUCTIVITY AND QUALITY OF WORK LIFE

Perhaps the major problem with employee involvement is that many managers do not see the connection between productivity and quality of work life. Yet, the main effect of employee involvement is to improve the employees' quality of work life; it makes the job and the employment relationship more satisfying. In turn, employee-initiated workplace improvements lead to increased productivity through increased commitment to the organization and its objectives.

The clearest connection between employee involvement and quality of work life is shown in the features of the ideal organization. Table 2 lists characteristics commonly identified by people when asked to describe an ideal organization. Firms that lack most or all of these characteristics do not provide a high quality of work life. People are frustrated, uncertain of what is expected. Outstanding performance is treated in a manner similar to acceptable performance. Top management may have motives for improvement, but employees see few reasons for improving their performance and productivity. Productivity gains, if any, come from new equipment, technological advances, or favorable economic circumstances. Even when productivity gains do accrue to the firm, they often are less than gains that might be expected from employees who experience high quality of work life and the commitment it implies.

Through increased employee involvement, however, employees are given opportunities to clarify objectives and role expectations. The process of participation leads to opportunities for recognition, autonomy, growth, achievement, and feedback. Involvement presents employees with new challenges that add variety to daily tasks. Improved communications lead to better rapport with management, which provides additional insights into leadership styles and performance expectations. People become more open and willing to find better ways of doing their jobs.

TABLE 2

CHARACTERISTICS OF THE IDEAL CORPORATION

- Clear objectives
- Good communications and feelings of trust
- Meaningful work with challenge and variety
- Known role expectations
- Opportunities for recognition, autonomy, growth, and achievement
- Ample feedback on performance
- Capable leadership
- Fair treatment (including discipline and compensation)
- Success at meeting organizational objectives and employee needs

Source: Developed by the author based upon the in-class responses of more than 1,000 seminar participants.

Japanese vs. American Approaches

Perhaps nowhere is the impact of employee involvement and quality of work life more evident than in the gains made by Japanese firms. The approach of major Japanese firms to employee involvement offers a useful contrast with American management practices. Some of the more noteworthy comparisons are highlighted in Table 3. These differences certainly are not the only reasons for Japan's post-World War II success. However, they do contribute to the well publicized work ethic of Japanese workers.[2]

TABLE 3

JAPANESE AND AMERICAN APPROACHES TO EMPLOYEE RELATIONS

Japan	*United States*
1. "Lifetime employment"	No employment guarantees
2. Extensive pre-employment and post-employment orientation	Minimal new-employee orientation
3. Seek employee suggestions	Resist employee ideas
4. Emphasis on quality	Emphasis on costs
5. Decision making through participation and consensus	Decision making through reliance on authority

Source: Developed by the author.

Lifetime employment. Not all Japanese workers have lifetime employment. Most women, workers over age 55, and employees of small firms lack this level of employment security. However, the major Japanese employers — particularly those successful firms with which United States industry must compete — usually offer employment for life to their core work force of Japanese males.[3]

While American managers fear indolent workers as the result of lifetime employment, Japanese managers get high commitment and performance. Poor performers in Japan are subject to discipline by management and peer pressure. But those who wish to perform have the freedom to be creative. If production workers or supervisors can eliminate their job, the prospect is recognition, not the unemployment line. Job security is assured if the firm survives. This realization causes Japanese employees to see their personal success as intertwined with their employer's success. Perhaps this relationship is best illustrated by the observation of Kyonosuke Ibe, Chairman of Sumitomo Bank.

> In Japan, when a worker is asked what he does for a living, he generally tells you he works for Sumitomo or Mitsubishi or Matsushita. It takes a second question to find out that he is a chauffeur, or engineer, or chemist, which, in my experience, is the first answer you get from an American.[4]

Although a policy of lifetime employment sounds abhorrent to most American managers, it is often an unstated but common reality. Few firms ever lay off workers with more than five years' seniority. Growth companies, like IBM, boast of not laying off a worker in over thirty-five years.[5] Even the disastrous 1980 production year in the American automobile industry saw the vast majority of American automobile workers escaping layoffs. Perhaps a greater commitment to employee job security by American firms might be reciprocated by a stronger commitment of employees to the organization and its objectives.

Orientation. Most American employee orientation programs are postemployment sessions of a few hours to half a day. Then, too often, the employee is left exposed to sink or swim. Many Japanese firms, however, provide extensive preemployment education. These efforts go beyond even the use of job previews found in some American firms. The Japanese approach may involve several posthire, preemployment trips to the firm's facilities. Extensive company literature is given the worker before employment begins. Materials range from detailed accounts of the company's history to procedures manuals.[6] When the employee does report for work, it is often marked by an entrance ceremony followed by extensive orientation and training that continue throughout the worker's career.

Quality vs. costs. The emphasis on quality gives many Japanese firms a core value that serves as a template against which even low level decisions are evaluated.[7] Although American firms seek quality too, their emphasis is often on cost effectiveness. The subtle communication received by workers from their supervisors is that cost effectiveness is the main concern. By contrast, Japanese managers expect the worker to be concerned with quality and not leave it to some distant quality control department. Often, each worker is expected to check the quality of previous steps in the production process. At Toyota, for example, production workers are allowed to halt the assembly line when defects are uncovered.

Employee suggestions. Since Japanese workers often identify closely with the employer, they often feel obligated to provide ideas and suggestions. Against the backdrop of employment security, ideas have little chance of creating a loss of job or status.[8] Moreover, this ethic of seeking employee ideas is seen as a key part of the supervisor's role.

The contrast with American supervisors is often one of perspective. American managers evaluate new ideas in terms of net benefits to the organization. From the expected gains of the idea, the costs (financial and psychological) of the change are subtracted. The Oriental perspective is different. Japanese supervisors often take the view that all employee ideas should be implemented unless an obvious harm would result. Although many ideas may have little or no benefit, the implementation of even marginal ideas reinforces the employee's desire to provide other suggestions, which may lead to substantial improvements in productivity.

Consensus management. Beyond merely seeking employee suggestions, Japanese managers appear to value consensus among those affected by a decision.[9] From a Western perspective, Japanese managers may appear indecisive and slow to make decisions. More accurately, these managers devote considerable time to participatively formulating a statement of the problem and exploring the alternatives. Although the process is initially time consuming, the result is a consensus among those affected by the decision. When the decision is made, its implementation encounters comparatively little resistance.

By contrast, American management styles seem to favor unilateral decision making — often in the name of accountability. While the formulation of the prob-

lem and exploration of alternatives move quickly, these managers usually expend considerable time and effort overcoming subsequent resistance to the change caused by the decision.

Whether the Japanese or American styles result in better or faster decisions is unclear. What is clear, however, is that employee commitment to decisions is apt to be higher under the Japanese approach. Furthermore, feelings of employee satisfaction, quality of work life, recognition, achievement, growth, and organizational loyalty are all likely to be higher.

The Cultural Barrier Myth

American managers often dismiss cross-cultural comparisons of management style as not appropriate in the United States work environment. They reason that the cultures and people are so vastly different that the use of Japanese techniques on American workers would be folly. Although systematic studies are unavailable, limited case evidence suggests that Japanese-inspired leadership styles are successful with American workers.

Sony, Sanyo, Honda, and Quasar have reported excellent results with their American facilities. In some cases, quality, productivity, costs, and employee satisfaction have been improved simultaneously, as happened at Quasar.

Although limited case evidence does not validate the universal applicability of Japanese approaches, their methods are compatible with the description of the ideal organization. Their techniques provide employees with high levels of security to meet basic needs; participation through employee involvement contributes to social need satisfactions; and the involvement creates opportunities for recognition, personal growth, achievement, and other potential motivators.

INVOLVEMENT TECHNIQUES: AN OVERVIEW

With a population approximately one-half of the United States, on a land mass the size of Montana, and with few natural resources, the Japanese leaders during the post-World War II era recognized the need for export earnings. To survive in the export markets they saw the need for high quality products. With human resources as the only apparent abundant commodity, this small island nation recognized the crucial role that people would (in fact, must) play in rebuilding Japan.

Quality Control Circles

Out of the necessities of their condition, Japanese firms developed internal cultures that prize cooperation, teamwork, and employee participation. Although many involvement techniques are used in Japan, the most common formal approach is quality control circles.

Quality control circles are workplace teams composed of the immediate supervisor and subordinates. Circles are created voluntarily. Only if the supervisor wants to create one, and only if the employees agree to join, do circles occur in Japanese plants.

When a supervisor elects to form one, the supervisor receives training in group dynamics, meeting skills, and decision making. Employees also receive training in problem-solving and decision-making skills. Training usually includes explanations of brainstorming, *Pareto* analysis, cause and effect diagrams, check sheets, and other data gathering and analyzing tools.

Once the initial training phase is completed, employees and their supervisor meet for one hour per week on company time. During this meeting, the group (not management) identifies and selects work-related problems that it wishes to solve. Members use brainstorming, data gathering, and other techniques to uncover the causes of the problem objectively. Recommended solutions are presented to management, which retains the authority to decide on implementation. Then the group selects another problem and the process continues.

This approach, or variations of it, has been applied successfully in the United States. Companies such as Lockheed, General Motors, Northrup, Solar Turbines, RCA, Control Data, and others often report returns of 200, 300, and even 400 percent on their investments in quality circle programs. More striking than the financial benefits are the perceptions of managers and workers about improvements in absenteeism, employee turnover, satisfaction, attitude, and production.

Other Involvement Techniques

Even where quality circles are inappropriate or unwanted by management, other involvement techniques have proved helpful in improving both productivity and the quality of work life.

Team-building approaches that do not follow the rigid pattern of quality circles may achieve similar benefits. These approaches may vary the training content, structure, or voluntary nature of the group, when compared with quality circles, but the key similarity is a team spirit built through group training and problem-solving sessions.

Even suggestion systems have proved to be a useful involvement technique. Successful systems usually omit

the "suggestion box" and instead mandate employees and supervisors to discuss the suggestions of the employee. This discussion serves as an opportunity for improved communications (particularly feedback about the idea), involvement in refining the idea, growth, and recognition. American companies like Allen-Bradley, IBM, Beech Aircraft, Honeywell, and Phillips Petroleum are just a few of the firms that have effective suggestion programs.

PROGRAMS VERSUS A WAY OF LIFE

Interestingly, many employee involvement efforts are implemented for reasons other than improving productivity. Safety, employee satisfaction, and communication improvements are other common goals. But a common thread seems to run among the long-established and more successful employee involvement efforts. Most of the administrators avoid thinking of their approaches as programs. Instead, they view employee involvement activities as an ongoing way of life that seeks a high quality of working life for all employees.

This view moves these managers away from thinking in terms of a short duration quick fix to employee satisfaction. Instead, they seek to build a work force committed to the organization and an organization committed to a high quality work life.

Although these managers seldom discuss profitability or productivity, they often view these gains as by-products of a high quality work life. They realize that the path to their productivity goal is a cohesive and goal-oriented worker even though short-run profits can be maximized through autocratic approaches, pressure for performance, forceful discipline, and fear. But like their Japanese counterparts, they prefer to build a high quality of work life environment, which leads to improved productivity and profitability in the long run.

PRODUCTIVITY AND MANAGERS: THE CONCLUSIONS

Productivity improvement — the increase of outputs relative to inputs — is the basis for improving the success of our organizations and the well-being of our society. As our once abundant resources are consumed, the ability of our nation's organizations to deliver more products and services will depend on how well our resource inputs can be converted to outputs that satisfy the needs of our nation and its people.

Like the Japanese after World War II, our most bountiful and important resource is the skill and creativity of our people — all our people. The United States can no longer afford to leave the challenge and creativity of work to management alone. Even the most competent and capable managers must seek the good ideas of their employees. Not only must managers make use of their employees' creativity, but they must also make work challenging if this country is to tap the potential wellspring of productivity every employee offers. What can individual managers do to improve the productivity of our nation? They can and must involve all their human resources in problem-solving and decision-making processes.

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[2]James D. Hodgson, *The Wondrous Working World of Japan* (Washington, D.C.: American Enterprise Institute, 1978).

[3]Peter F. Drucker, "The Price of Success: Japan Revisited," *Across the Board*, August, 1978, p. 30.

[4]Kyonosuke Ibe, "It Took the Japanese to Build Japan," *Business Week*, October 6, 1980, p. 17.

[5]"*How IBM Avoids Layoffs Through Retraining*," *Business Week*, November 10, 1975, pp. 110, 112.

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[7]Thomas J. Peters, "Putting Excellence into Management," *Business Week*, July 21, 1980, pp. 196-197, 200, 205.

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Productivity Measurement

WILLIAM A. RUCH

The problem of declining productivity is one of the most challenging problems facing the United States economy today. Many people are writing and discussing the problem, yet the few effective solutions that have been developed by industry or by academic researchers have been insufficient to keep the productivity growth rate from declining into the negative range. Judging from the volumes that have been written in recent years and the continued poor results, it is clear that more is written about productivity than is known about it.

Many fundamental causes for the decline in national productivity have been offered. Although the experts do not completely agree, it is clear that there is no one cause nor one cure. For individual firms, there are more programs, techniques, and treatments to improve productivity than there are drugs in a drug store. Each technique may be effective in some situations but ineffective or even damaging in others. The only way a firm can evaluate the effectiveness of its productivity improvement efforts — whatever techniques are used — is through a system of productivity measurement.

The primary purposes of productivity measurement are to audit the current productivity status of the firm through comparison to other firms, to other divisions within the firm, or to industry averages; and to evaluate the effectiveness of productivity efforts by monitoring progress toward goals. Productivity measurement is not intended to improve productivity, although some firms have reported an improvement resulting from the process of developing and implementing a measurement system. Normally, however, measurement does not cause productivity improvement. Systematic progress toward productivity improvement objectives, however, is nearly impossible without some valid method of measurement.

The only way a firm can evaluate the effectiveness of its productivity improvement efforts is through a system of productivity measurement. This article discusses several partial productivity measures and describes in detail the system of total firm productivity measurement.

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PRODUCTIVITY DEFINITION

Many think of productivity as being a measure of labor, usually expressed as output per hour. Actually it is a much broader concept than that. Productivity is any output to input ratio. For the firm as a whole, outputs include all goods and services produced during a given time. Inputs include all resources consumed to produce those outputs. Labor is one of the input resources but so too are capital, material, and energy. Virtually all of the resources used by the firm fall in one of these four categories.

For this discussion, total firm productivity is defined as follows:

$$\text{Productivity} = \frac{\text{output} = \text{goods and services produced}}{\text{input} = \text{labor \& capital \& materials \& energy}}$$

Any measure which compares output to just one of the inputs, such as units per hour, is a partial productivity measure. Most of the common productivity measures used today are partial measures, although methods are being developed to measure the total productivity of the firm. There is nothing wrong with partial measures except that they do not show the total picture. Labor productivity, for example, could be vastly improved by being very ineffective and inefficient in the use of capital, energy and materials. Obviously, if the firm is to succeed, it must effectively manage all four resources.

COMMON PARTIAL PRODUCTIVITY MEASURES

Development of partial measures of productivity centers on issues of measuring outputs and on measuring each of the input factors.

Output Measures

Output should include all goods and services produced in a period independent of the amount actually sold and independent of changes in price. Rarely is this accomplished. Usually sales or sales deflated to constant dollars is used. The value of services such as delivery, set-up, maintenance, etc. should be included but often the accounting problems do not justify the last increment of accuracy.

Measurements of subunits of the firm such as purchasing, data processing, and personnel are difficult because of the lack of definable, measurable output units. Often, the system measures *activities* such as purchase orders written, programs compiled or interviews conducted rather than measuring true *results*. Until the solution to this measurement problem is found, suboptimization is likely to occur. For example, if programmers are measured by the number of lines written, operators can easily pad the program with unnecessary lines; they are working to maximize the measure but their activities are counterproductive to the organization.

Common measures of output for the firm or for subunits of the firm include:

- Sales
- Sales in constant dollars
- Units (such as cars, books, hamburgers, etc.)
- Customers served
- Aggregate common unit
- Value added

An aggregate common unit could take many forms. In many industries "tons shipped" is a reasonable measure of volume of output, although significant changes in product mix could be a problem. In some industries, such as petroleum refining, different outputs may be converted to a common physical measure like BTUs of energy. A similar technique is to define all outputs relative to one basic unit of output. A fast food restaurant, for example, could define the hamburger as the basic unit. Each cheeseburger could be counted as 1.2 hamburgers, a double-decker as 1.75 hamburgers, and so on.

"Value added" is the sales revenue of a firm less all costs of raw material. For example, suppose a firm buys lumber and makes cabinets. The true output of this firm could be defined as the value that it adds to the material in the chain of processing from the forest to the consumer.

In the discussion of the inputs below, any of these measures of output could be combined with any of the input measures.

Labor Productivity

Common measures of labor productivity include:

- Output per hour
- Output per employee
- Output per labor cost (payroll)
- Output per constant labor cost

Output per hour and per employee have the advantage of being unrelated to changes in wage rates. They will differ, of course, with the use of overtime and part-time employees. Labor cost may be direct wages only or it may include all fringes and benefits. Constant labor cost involves deflating wage increases by multiplying hours currently worked by a base year wage rate.

Capital Productivity

Common measures of capital productivity include:

- Output per dollar invested
- Output per dollar consumed
- Output per machine hour

Each of these measures contains drawbacks. Output per dollar invested is subject to differences in the way capital is valued and depreciated. Also, recent investments cause the denominator to rise immediately while the effect in increased output may come much later. Output per dollar consumed involves spreading the cost of an asset over its useful life and charging off this cost as the asset is used. Output per machine hour is a useful measure, but frequent changes in technology disrupt the continuity of the measure.

Material Productivity

Common measures of material productivity include:

- Output per unit
- Output per dollar
- Output per constant dollar

Output per unit (such as cars produced per ton of steel purchased) is closely related to measures of scrap and waste. If 4 percent of the material is scrap, then 96 percent must have become part of the output. Productivity measures, however, are expressed as a unit to unit ratio rather than as a percentage utilization. The dollar value of all purchases can be used as material input, but if changes in material costs are to be deflated, units of material used can be multiplied by a base year price to obtain constant dollar cost.

It should be noted that if value added is used as an output measure, material productivity becomes meaningless.

Energy Productivity

Common measures of energy productivity include:

- Output per unit
- Output per cost
- Output per constant cost
- Output per aggregate common unit

The unit of energy may be kilowatt hour, barrel of heating oil, cubic foot of gas or any other physical unit. Cost is rarely used today because of the great fluctuations in unit energy cost, but constant cost may be used. Aggregate common units for energy would involve converting various sources of energy to some common physical unit such as BTUs.

The importance of energy is leading many firms to place a higher priority on monitoring and improving energy usage.

Summary of Partial Measures

Considering all the different output and input combinations that could be derived, there are literally hundreds of partial productivity measures that could be developed. Obviously not all are applicable to every firm. The set of partial measures used should reflect the importance of the resource to the firm and its ability to control or manage that resource; and, wherever possible, it should utilize existing data in the firm and fit with the accounting and other information systems in the organization.

If the firm does not have a sophisticated management information system and is just beginning to measure productivity, it should start simple and let the set of measures gradually be refined over time. For example, the firm could start with labor measures like sales per employee, meals served per dollar of labor cost, or tons shipped per direct labor hour. Similar output to input measures could be chosen for other input factors (capital, material, and energy). As pointed out, each of these measures is imperfect, but as employees become accustomed to using the measures, refinements such as deflating prices and costs to constant dollars can be added.

For the firm capable of handling a more sophisticated measurement system, the recently developed total firm productivity measurement system, described in the following section, combines all four input factors into a set of change ratios which measures productivity and its effect on the profitability of the firm.

TOTAL FIRM PRODUCTIVITY MEASUREMENT

Perhaps the most comprehensive measurement of firm productivity is a system developed by the American Productivity Center of Houston, Texas.[1] The system is based on the following assumptions:

- Output can be measured by sales.
- Inputs can be measured by costs.
- Profit is the difference between sales and costs.
- Profitability can be defined and measured as the ratio of sales to costs.
- Sales can be broken down into quantities sold (of perhaps many different items) times their respective prices.
- Costs can be broken down into quantities (such as hours of labor, units of materials, dollars of capital, kilowatt hours of energy) times their respective unit costs.
- The profitability ratio of sales to costs can thus be converted to a ratio of output quantities times prices in the numerator to input quantities times unit costs in the denominator.
- This ratio can be converted into the product of two ratios: the first is a ratio of output quantities to input quantities, the second is a ratio of output prices to input unit costs.

These relationships are illustrated in the following equation:

$$\text{Profitability} = \frac{\text{Sales}}{\text{Costs}}$$

$$= \frac{\text{Output Quantities x Prices}}{\text{Input Quantities x Unit Costs}}$$

$$= \frac{\text{Output Quantities}}{\text{Input Quantities}} \times \frac{\text{Prices}}{\text{Unit Costs}}$$

The first of these two ratios, output quantity over input quantity, is productivity. It is an output to input ratio in terms of units rather than prices, and it tells the amount of resources consumed to produce the firm's output. (Appropriate inventory change figures can be factored in to adjust for differences between sales and production.)

The second ratio, output prices over input unit costs, is price recovery. Changes in this ratio over time indicate whether changes in input costs are absorbed, passed on, or over-compensated for in the prices of the firm's output. A change ratio of less than one means the firm is helping to reduce inflation while greater than one would indicate a contribution to increasing inflation.

The equation can be restated (in English) as:

Profitability = Productivity x Price Recovery

In these terms, a change in profit from one period to the next must be explained by a change in productivity, a change in price recovery, or a combination of the two. In other words, there are only two ways a firm can increase profit next period: it can produce more output per unit of input consumed or it can raise its prices faster than its suppliers are raising theirs.

The computations involved in this measurement system are relatively simple. Quantities of outputs and inputs from each year are multiplied by base-year prices to derive the productivity change ratio. Prices and unit costs for each year are multiplied by current year quantities to yield a price recovery change ratio. Unit costs for labor, materials, and energy are straightforward. The cost for capital is computed as the total of depreciation plus profit relative to the total assets employed. Capital costs for the second year, therefore, would be actual second year depreciation plus base year return on assets times current assets employed. In other words, profit for the second year is calculated as if the firm had been just as profitable relative to its assets as it was in the first year. Differences between this calculated profit figure and the actual profit in the second year (over or under) is the figure that results from changes in the productivity or the price recovery of the firm.

An example will serve to illustrate the results obtained. Table 1 contains the basic data needed to compute the ratios. Note that from period one to period two the two outputs have changed in amount, in product mix, and in price. Similarly, labor, capital, materials, and energy have undergone changes. Careful analysis of this table could reveal some problems (30 percent wage increases for example) but it is not immediately obvious whether the input factors are more or less productive in the second period.

The output and the first three inputs are straightforward accounting calculations of value determined by the quantity sold or used multiplied by its price or unit cost. The capital input deserves additional explanation.

In period one, $300,000 of capital assets yielded $15,000 in depreciation for an average depreciation rate of 5 percent. This is the first component of capital cost. The second component is the profit that was earned in period one ($18,800). This profit is weighed against total capital made up of $300,000 in fixed assets and $100,000 or working capital such as inventories or accounts receivable. Together, deprecation and profit make up the charge for capital use during period one, and the return on assets of 4.7 percent serves as a price to be paid per dollar of capital employed.

In period two, depreciation remains the same (no changes in fixed assets occurred). Working capital, however, increased so the return-on-assets figure from period one is applied to the new total assets figure to yield $20,210. This is the profit that should have been made if the firm had maintained its profitability relative to assets. Actual profit in period two was only $15,540[2] so the firm fell short by $4,670. Apparently the firm is less successful, but the reasons for the decline must be sorted out of the data.

To understand the next table, begin by calculating a base period weighted labor productivity change ratio. Labor productivity in period one (the base period) would be:

$$L_1 = \frac{(1000)\,(\$50) + (200)\,(\$200)}{(4000)\,(\$6.00) + (1000)\,(\$8.00)} = 2.81$$

For period two, weight the quantities of outputs and inputs using base period prices and costs. This freezes the dollar figures and removes the effects of inflation.

TABLE 1

BASIC DATA FOR TOTAL FIRM PRODUCTIVITY MEASUREMENT

	Period 1			*Period 2*		
	Value	*Quantity*	*Price*	*Value*	*Quantity*	*Price*
Output						
Product A (Chairs)	$50,000	1,000	$ 50	$ 66,000	1,200	$ 55
Product B (Tables)	$40,000	200	$200	$ 33,600	160	$210
Total Output	$90,000			$ 99,600		
Input						
Materials						
M-1 (Wood)	$20,000	20,000	$ 1.00	$ 25,200	21,000	$ 1.20
M-2 (Varnish)	$ 1,000	100	$ 10.00	$ 1,200	100	$ 12.00
M-3 (Nails)	$ 200	200	$ 1.00	$ 160	148	$ 1.08
	$21,200			$ 26,560		
Labor						
L-1 (Woodworker)	$24,000	4,000	$ 6.00	$ 30,400	3,800	$ 8.00
L-2 (Finishers)	$ 8,000	1,000	$ 8.00	$ 8,320	800	$ 10.40
	$32,000			$ 38,720		
Energy	$ 3,000	30,000	$ 0.10	$ 3,780	27,000	$ 0.14
Capital						
Depreciation	$15,000	300,000	0.050	$ 15,000	300,000	$ 0.050
Return	$18,800	400,000	0.047	$ 20,210	430,000	$ 0.047
	$33,800			$ 35,210		
Total Input	$90,000			$104,270		
Deviation				<4,670>		

Source: Developed by the American Productivity Center.

$$L_2 = \frac{(1200)(\$50) + (160)(\$200)}{(3800)(\$6.00) + (800)(\$8.00)} = 3.15$$

The change ratio for labor productivity is:

$$\frac{L_2}{L_1} = \frac{3.15}{2.81}(100) = 112\%$$

From period one to period two, labor productivity increased by 12 percent. This reflects a change in both input and output mix, but removes the confounding effects of inflation.

Similar calculations could be performed to yield a productivity ratio for each input factor and one for total output relative to the total of all inputs, that is total productivity. But why stop there? If quantities can be weighted by price, prices can also be weighted by quantity.[3] The result would be a series of price recovery ratios. The price recovery ratio for labor, for example, would show how fast prices of the firms outputs had increased relative to increases in the wage rates of labor. Finally, the productivity change ratio and the price recovery change ratio could be multiplied to find the effect on profitability of each input factor. A complete set of these change ratios is contained in Table 2.

TABLE 2

TOTAL FIRM PERFORMANCE MEASUREMENT

	Value		*Performance Indexes*		
	Period 1	*Period 2*	*Profitability*	*Productivity*	*Price Recovery*
Output					
Product A	50,000	66,000			
Product B	40,000	33,600			
Total	90,000	99,600			
Input					
Materials	21,200	26,560	88.3	97.8	90.3
Labor	32,000	38,720	91.5	112.0	81.6
Energy	3,000	3,780	87.8	113.6	77.3
Capital	33,800	35,210	106.2	98.1	108.3
Total	90,000	104,270	95.5	103.1	92.7

Source: Developed by the American Productivity Center.

The 12 percent increase in labor productivity indicates more chairs and tables were produced by the workers, but the price recovery ratio of 81.6 percent reflects wage rate increases far greater than output price increases. In this example, the wage increases overshadowed the productivity increase and the net effect of

labor on the profitability of the firm was 91.5 percent, a drop of 8.5 percent from the base period. The problem for this firm appears to be at the negotiation table rather than on the factory floor.

Similar interpretations can be made on each of the other input factors. Energy, for example, was used much more productively; but, as one might expect, energy costs per unit rose much faster than did the firm's prices. The net effect of energy on profitability was 87.8 percent; however, in this example energy is the smallest of the inputs in terms of dollar value. Additional insight can be gained, therefore, by converting the percentages into dollar effects on profit. The result is the data in Table 3.

TABLE 3

EFFECTS OF PRODUCTIVITY AND PRICE RECOVERY ON PROFIT

	Value		*Effect on Profit*		
	Period 1	*Period 2*	*Profitability*	*Productivity*	*Price Recovery*
Output					
Product A	50,000	66,000			
Product B	40,000	33,600			
Total	90,000	99,600			
Input					
Materials	21,200	26,560	<3,099>	<477>	<2,622>
Labor	32,000	38,720	<3,307>	3,511	<6,818>
Energy	3,000	3,780	<460>	367	<827>
Capital	33,800	35,210	2,196	<658>	2,854
Total	90,000	104,270	<4,670>	2,743	<7,413>

Source: Developed by the American Productivity Center.

Tables 2 and 3 indicate that overall the firm was 3.1 percent more productive which would have earned $2,743 more in profit. Increasing unit costs of inputs, however, relative to price increases gave the firm a price recovery ratio of 92.7 percent which, by itself, would have lowered profit by $7,413. The combined effect is profitability of 95.5 percent representing $4,670 less in profit than would have been earned if the firm had maintained parity in all performance measures for period two.

At this point the firm has a good picture of the source of its profitability. If profitability is up, then it can determine if the increase is due to better resource utilization (productivity) or to better cost control and pricing policies. In some cases, a firm may have declining productivity but be able to raise prices enough to pass its inefficiencies on to the customer. Thus it looks successful because it is profitable, but the inefficiencies in resource utilization will eventually cause the firm to fall when it meets competition — foreign or domestic — that can manage productivity. A firm with increasing productivity can absorb higher input costs and hold the line or even reduce output prices while continuing to make a substantial profit.

The two total measures of productivity and price recovery give a good overall evaluation of the success of the firm — far better than profit or return on assets alone. In addition, the eight factor ratios begin to explain resource ulitization, pricing policies, and cost control in a way that permits the firm to focus efforts where the true problems lie and to evaluate the tradeoffs and other complexities of major changes. The system is not perfect, by any means. It does provide a perspective of firm performance, however, that has not been available through conventional evaluation techniques.

CONCLUSIONS

In order to improve productivity, a firm needs a productivity measurement system. Improvement effort without measurement is shooting in the dark. The system should measure utilization, not just inflation. Wherever possible, measures should be divorced from the confounding effects of changes in prices and costs. The measurement system should identify problems (do we have a problem?), isolate problems (where or what is the problem?) and lead to corrective action (what can we do about it?). It should monitor progress and permit the evaluation of past efforts to improve productivity.

The measurement system that approaches these goals will likely be a series or family of measures, some total productivity measures of firm performance to tell if a problem exists and some partial measures to suggest areas for improvement efforts. Finally, the measurement system for a firm most likely will be unique in some respects. In the final analysis, the characteristics of the firm will dictate the specific nature of the outputs and inputs to be measured.

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[1]For further information on this performance measurement system, contact the Measurement Department, American Productivity Center, 123 N. Post Oak Lane, Houston, Texas 77024.

[2]Actual profit is not shown in this format, but it can be calculated as the difference between revenue and total costs of the inputs.

[3]Mathematical logic demands that if quantities are base period price weighted, prices must be current period quantity weighted so that the product of productivity and price recovery yield the desired effect on profit.

Doctoral Dissertation Abstracts

COLLEGE OF BUSINESS ADMINISTRATION
ARIZONA STATE UNIVERSITY

Editor's Note: *Our readers are often interested in research undertaken by doctoral candidates in the College of Business Administration at Arizona State University. Therefore, we occasionally include one or two abstracts of doctoral dissertations in* Arizona Business. *Readers who wish further information on any of these subjects may examine the complete dissertations in the ASU Hayden Library.*

THE IMPACT OF INDUSTRIAL STRUCTURE ON LABOR FORCE PARTICIPATION RATES IN NINE WESTERN STATES

Ronald Andrew Madsen

The focus of this study is on examining how differences in industrial structure affect selected sex-age groups' labor force participation rates. Earlier research studies have analyzed differences in industrial structure by measuring expected employment opportunities that were sex, sex-age, and sex-industry specific. This study extends the approaches used in the earlier studies by analyzing: (1) the impact on given sex-age groups' labor force participation rates of expected employment opportunities that are sex-age-industry specific; (2) the impact of the expected employment opportunities for all other age groups of the same sex on the labor force participation rates of given sex-age groups; and (3) the impact of the expected employment opportunities of members of the opposite sex on the labor force participation rates of given sex-age groups. The research utilized multiple linear regression techniques to analyze cross-sectional county specific 1970 census data for nine western states. The regression results led to the following conclusions:

- Differences in industrial structure, measured by expected employment opportunities, were important determinants of the labor force participation rates of the different sex-age groups.
- The impact of industrial structure on the participation of a given sex-age group depended importantly on the industry in which the employment opportunities were expected to exist.
- The participation rates of the two prime-age groups (25 to 44 years and 45 to 64 years) of each sex were more frequently affected by industry specific expected employment opportunities than were the participation rates of other age groups.
- It was not possible to precisely separate the "age" or "other age" specific impact on participation rates of expected employment opportunities in a given industry for a given sex.
- The results strongly indicate that the labor force participation rates of both males and females were more responsive to the employment opportunities expected for their own sex than to the employment opportunities expected for the opposite sex.

Ronald Andrew Madsen is Assistant Professor of Economics at the University of North Carolina, Charlotte, North Carolina. The chairman of his dissertation committee was Dr. Paul Burgess, Associate Professor of Economics.

PROCEDURES USED BY FIRMS IN SIX MANUFACTURING INDUSTRIES TO SELECT FOREIGN VENDORS

Robert A. Kemp

A review of literature concerning purchasing revealed a need for empirical research of the procedures used to buy foreign resources for use in domestic manufacturing operations. The investigation used six manufacturing industries and two purchase class situations. The industries were: chemicals, metals, fabricators, machinery, electrical, and transportation. The six industries buy about 47.4 percent of materials and capital equipment used for manufacturing in the United States, and make about 50.2 percent (dollar value) of the shipments of manufactured goods in the country. The two purchase classes were raw materials and parts or components.

A two-phased mail questionnaire was used to collect data. Phase one collected data concerning the use of foreign sources from 745 firms. Of these firms, 495 used foreign sources and were used in phase two. The phase-two data included responses from 385 firms. The respondents provided data concerning: (1) the reasons for using foreign sources, (2) the importance of factors used in the vendor-selection process, (3) the number of factors used in the vendor-selection system, (4) the methods and information systems used to qualify foreign vendors, and (5) the level of use of foreign sources over two time frames, pre-1973 to 1976 and 1976 to 1981.

The major results were:

(1) The level-of-use of foreign sources has increased between pre-1973 and 1976. Moreover, it will continue to increase into 1981.

(2) The use of foreign sources is not primarily attributable to the size of the firm.

(3) The most cited reasons for using foreign sources were those concerning price of materials and the continuity of supply.

(4) The response rates to four reasons identified meaningful differences between the six industries concerning: (a) the availability of materials or technology only from foreign sources, and (b) the ability of foreign suppliers to support other foreign operations of the firm.

(5) The importance values for the vendor-selection factors divided the industries into two groups based on the purchase class. The first industrial group, chemicals, metals, and fabricators, gave higher average-importance values to the factors for raw materials. The second group, machinery, electrical, and transportation, gave the higher-importance values to the factors for the parts and components purchase class.

(6) The number of vendor-selection factors used by the firms suggest that considerable emphasis is placed on the pre-selection vendor-evaluation process for foreign vendors.

The results of this research should be useful to three categories of firms: (1) those firms that currently utilize foreign sources, (2) those firms that are considering foreign suppliers, and (3) the foreign vendors. Purchasing managers that currently use foreign sources may use the dissertation to evaluate the ongoing purchasing process. Similarly, the dissertation includes a seven-step process for establishing the foreign vendor-selection process by firms not now using foreign sources. Finally, the dissertation provides useful data for the foreign vendor seeking to enter markets in the United States. In each case, managers should find the situational nature of the data an important asset as the guidance is used by a specific firm.

Robert A. Kemp is Director of Business and Communications, Phillips University, Enid, Oklahoma. The chairman of his dissertation committee was Dr. Harold Fearon, Professor of Management.

The Arizona Business Scene

The Show Low, Lakeside, Pinetop Area

Show Low, Lakeside, and Pinetop, three northern Arizona towns, are located in proximity to each other in southeastern Navajo County. This area is only about 175 miles northeast of Phoenix, but its climate, vegetation, and topography are worlds apart from that of Phoenix and Tucson. Southeastern Navajo County is situated in the midst of a national forest, at a mountain elevation of 6,400 to 7,200 feet. The area is 20 to 30 degrees cooler than Phoenix year round, and receives more precipitation than the desert areas. Summers are cool, showers are frequent, and snow is common in the winter. The result of this climate is a green area of pine and oak trees, studded with lakes and streams. The topography is hilly with the steep Mogollon Rim just to the south and the high peaks of the White Mountains a short distance to the east.

Pinetop and Lakeside are about three miles apart, while Show Low lies about ten miles to the northwest, but growth of the area is rapidly merging the three towns along the main highway connecting them. Climate and topography have made the area into a tourism and recreation center. The large Fort Apache Indian Reservation just south of the towns has done much to stimulate the growth of the area, with the development of lakes, camping areas, and a major winter sports area on its land. Recreational activities, both on the reservation and in the general area, include camping, fishing, horseback riding, hunting, and snow skiing.

When the area was first settled in the 1880s, its major industries were ranching and timber operations. In the past twenty years, however, the emphasis has switched to retail trade and services in response to the tourists and recreation seekers visiting the area. The result is that all three towns have grown rapidly.

In addition to the permanent population, shown in Table 1, southeastern Navajo County has a large number of part-time residents. Many people in the Phoenix and Tucson metropolitan areas have built second homes in the area, particularly around Pinetop, where there are a number of housing developments around country clubs or other recreational facilities. Thus, during certain times of the year the area's population may be far in excess of the figures in Table 1.

TABLE 1

POPULATION

City	*1970*	*1980*
Show Low	2,129	4,301
Pinetop	NA*	1,527
Lakeside	NA*	1,336

*Not available; both Pinetop and Lakeside are unincorporated towns.

Source: U.S. Department of Commerce, Bureau of the Census.

Most people in the area now find employment in the retail trade and the service sectors: approximately

40 percent and 30 percent respectively of the labor force. In Pinetop and Lakeside most of the trade and service employment is related to tourism and recreation, including such businesses as motels, restaurants, and automotive services. According to information gathered by the Bureau of Business and Economic Research in the ASU College of Business Administration, Navajo County as a whole attracts nearly two million tourists a year who spend approximately $70 million a year in the county; the southeastern part of the county accounts for a large portion of those tourists and their expenditures.

Show Low has become more than a tourism and recreation center, for its location along both U.S. Highway 60 and State Highway 260 has helped it become a regional trade and services center as well. One of Show Low's important economic sectors is wholesale trade, particularly oil, lumber, concrete, and bottled gas.

Since the area is growing rapidly, between 5 and 10 percent of the labor force is involved in construction. In Show Low the value of construction has been approximately $1.9 million in each of the last two years. Approximately 160 new housing starts were made in that town during these two years, but the climate makes construction employment heavily seasonal.

The transportation, communication, and public utility sector and the finance, insurance, and real estate sector each employ between 5 and 10 percent of the labor force of the area. Relatively large real estate employment has resulted from a statewide interest in the area's potential. Most of the manufacturing in the area is related to timber processing with two large sawmills located nearby. Less than 5 percent of the labor force is engaged in manufacturing, a much smaller percentage than in the state as a whole.

The agricultural sector now plays only a very minor role in the economy, except for timber production. Mining is also minimal. The National Forest Service provides some employment in the area, but relatively few other government positions are available.

Most of the necessary major facilities and services are available in the area. Medical facilities are available in Show Low, as is higher education through a branch of Northland Pioneer College. Numerous churches and community facilities are located throughout the area; communication media are represented locally by newspapers, radio stations, and by cable television from Tucson and Phoenix. The area's transportation needs are served by local airlines, which use Show Low airport; by the Apache Railroad, which links the area with the transcontinental railroad located about fifty miles north; by truck lines; and by a bus line.

Continued growth in the area is expected, as the number of part-time residents increases and as recreation and tourism continue. This growth will likely include increases in permanent population, construction activity, and services and facilities. Increases can also be expected to occur in the employment base, and in nearly every other economic facet of the area. The employment and economic structure will likely continue to be different from that of the urbanized areas of Arizona. These differences, as well as the inherent climatological and topographical differences, will continue to contrast southeastern Navajo County with the major urbanized desert areas of the state.

A Survey of Arizona Business Conditions

HAROLD FEARON

Following December's slight downturn, the Arizona economy resumed its upward movement in January, according to results from the monthly business survey of the Purchasing Management Association of Arizona. All indicators of economic activity turned positive again, with new orders received showing a good gain. The slight reversal that occurred in December, following the gains of August through November, evidently was only a temporary pause and not indicative of the beginning of a long-term downtrend. However, prices still are escalating at a high rate, and this in combination with the very high interest rates probably will cause sluggish economic growth at least through the end of the first quarter.

The purchasing business survey now is in its nineteenth year of consecutive monthly reporting on the current status of the Arizona economy. Data are gathered through a questionnaire sent at the close of each month to purchasing managers throughout the state, asking them to indicate the direction of activity — higher, unchanged, or lower — on six key indicators of economic activity in the month just ended. Since these purchasing managers deal daily with the forces of supply and demand, they are in a prime position to provide timely and accurate information on current business trends, which enables economic turning points to be spotted.

Dr. Fearon is Professor of Management in the College of Business Administration, Arizona State University.

Prices paid for major purchased items went up in January, at a substantially higher rate than in December and the highest rate since last April. Sixty-six percent of the purchasing managers reported they paid higher prices in January than in December; 31 percent saw prices unchanged; only 3 percent said prices declined. While the rate of price increases did show signs of moderating during the summer months, this slight relief in upward price pressures was short lived, and prices now again are increasing at an alarming rate. It is doubtful if much relief will be experienced before the beginning of summer.

Delivery time on shipments from vendors continued to stretch out, and at about the same rate as in each month during the fourth quarter. Longer delivery times were reported by 27 percent of the firms; 10 percent said they received faster service from their suppliers. While delivery times have been positive for the past six months, the increases have been marginal and far under those experienced during a normal economic upswing, showing that the recovery has not developed any real momentum.

Inventory levels of purchased materials increased in January, reversing December's slight drop. Inventory additions were reported by 31 percent of the firms, which was slightly larger than the 25 percent who reported a reduction in stocks. No major changes in inventory levels have been reported over the past five months, and the tight rein being held on stocks by Arizona firms was a major factor preventing the recent recession from becoming a really serious problem. The

current high interest rates will cause Arizona firms to keep very close controls on inventory investment.

New orders received from customers increased, reversing December's downturn which was the first since signs of an economic recovery became evident last August. Thirty-three percent of the firms booked more new business in January than in December, compared to only 22 percent who experienced a shrinkage of their order books. The December drop may have been a reflection of the holiday month, since there has been a fall in the new order rate in December in each of the past several years.

Production also turned up again in January, after the one-month December drop. Higher production was reported by 28 percent of the firms, slightly more than the 24 percent who cut output.

Employment was up, continuing the increase trend which began in September and has followed each month since, with the exception of a slight interruption in December, which saw employment unchanged. Twenty-two percent added to their work force; 17 percent pared payrolls. The employment increases over the past five months have been far lower than normally experienced during an upswing.

Thus, the new year has started off on a positive note, although the increases on all indicators, except prices paid, were moderate. A continuation of only marginal growth is likely over the next several months, until both interest and price increase rates begin to fall.

The results of the January purchasing survey are shown in Table 1.

TABLE 1

JANUARY PURCHASING SURVEY

	Percent of Purchasing Managers Indicating Each Response (January compared to December)		
Key Indicator	*Higher*	*Same*	*Lower*
Prices paid for major commodities	66	31	3
Delivery time from vendors	27	63	10
Purchased materials inventory level	31	44	25
New orders received	33	45	22
Production	28	48	24
Employment	22	61	17

Source: Survey of the Purchasing Management Association of Arizona.

ARIZONA SALES OF ELECTRICAL POWER
By Months in Millions of KWH*

Current Month:	*Actual:*		*Percent Change Current Month From*	
	1980	*1979*	*Same Month/ Prev. Year*	*Previous Month*
December	2275.5	2177.4	4.31	+ 8.05

* Based on reports from major suppliers.

DECEMBER, 1980

Arizona Building Permits: Monthly Report

	RESIDENTIAL*		COMMERCIAL		INDUSTRIAL		OTHER		TOTAL	
	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value
APACHE COUNTY	6	75,000	2	57,000	—	—	—	—	8	132,000
Eagar	—	—	1	57,000	—	—	—	—	1	57,000
St. Johns	3	N/C	—	—	—	—	—	—	3	—
Springerville	1	N/C	1	N/C	—	—	—	—	2	—
Unincorporated Apache County	2	75,000	—	—	—	—	—	—	2	75,000
COCHISE COUNTY	79	1,951,340	5	117,400	2	128,212	81	163,106	167	2,360,058
Benson	11	263,450	—	—	—	—	4	2,968	15	266,418
Bisbee	6	17,700	—	—	—	—	1	8,000	7	25,700
Douglas	7	281,318	—	—	—	—	10	20,126	17	301,444
Huachuca City	1	35,800	—	—	—	—	—	—	1	35,800
Sierra Vista	21	420,372	2	30,400	—	—	42	83,353	65	534,125
Tombstone	1	1,000	—	—	—	—	15	10,750	16	11,750
Unincorporated Cochise County	28	849,200	1	15,000	1	99,212	8	36,909	38	1,000,321
Willcox	4	82,500	2	72,000	1	29,000	1	1,000	8	184,500
COCONINO COUNTY	93	2,830,905	8	3,793,919	2	110,242	41	1,063,773	144	7,798,839
Flagstaff	33	1,828,801	6	440,112	2	110,242	23	1,049,093	64	3,428,248
Fredonia	2	1,500	—	—	—	—	1	500	3	2,000
Page	8	49,697	1	93,875	—	—	13	10,500	22	154,072
Unincorporated Coconino County	46	927,807	1	3,259,932	—	—	—	—	47	4,187,739
Williams	4	23,100	—	—	—	—	4	3,680	8	26,780
GILA COUNTY	39	474,736	2	34,902	—	—	18	69,372	59	579,010
Globe	3	52,200	—	—	—	—	1	3,000	4	55,200
Hayden	—	—	—	—	—	—	—	—	—	—
Miami	2	1,400	—	—	—	—	—	—	2	1,400
Payson	14	99,184	2	34,902	—	—	16	20,372	32	154,458
Unincorporated Gila County	20	321,952	—	—	—	—	1	46,000	21	367,952
GRAHAM COUNTY	38	739,184	3	223,200	—	—	1	15,000	42	977,384
Pima	—	—	—	—	—	—	—	—	—	—
Safford	9	214,600	1	170,000	—	—	1	15,000	11	399,600
Thatcher	5	7,000	—	—	—	—	—	—	5	7,000
Unincorporated Graham County	24	517,584	2	53,200	—	—	—	—	26	570,784
GREENLEE COUNTY	—	—	—	—	—	—	—	—	—	—
Clifton	—	—	—	—	—	—	—	—	—	—
Duncan	—	—	—	—	—	—	—	—	—	—
Unincorporated Greenlee County	—	—	—	—	—	—	—	—	—	—
MARICOPA COUNTY	1,862	47,257,583	113	33,711,903	37	9,760,052	1,523	32,743,141	3,535	123,472,679
Avondale	5	67,364	—	—	—	—	8	14,416	13	81,780
Buckeye	7	20,800	1	5,500	—	—	1	2,000	9	28,300
Chandler	294	9,248,432	3	147,000	3	2,203,195	287	399,020	587	11,997,647
El Mirage	4	24,826	—	—	—	—	—	—	4	24,826
Gila Bend	—	—	—	—	—	—	2	2,300	2	2,300
Gilbert	6	304,520	1	96,000	1	1,500	15	26,261	23	428,281
Glendale	85	1,969,200	14	2,485,300	—	—	123	375,227	222	4,829,727
Goodyear	—	—	1	110,000		—	6	84,495	7	194,495
Guadalupe	1	4,800	—	—	—	—	—	—	1	4,800
Mesa	121	4,011,538	10	2,454,850	2	3,245,000	259	1,216,325	392	10,927,713
Paradise Valley	21	1,601,438	—	—	—	—	21	455,689	42	2,057,127
Peoria	40	704,900	—	—	—	—	41	64,125	81	769,025
Phoenix	519	14,190,429	38	21,872,985	16	1,926,157	474	12,734,755	1,047	50,724,326
Scottsdale	123	5,853,974	6	2,280,898	—	—	147	1,107,832	276	9,242,704
Surprise	4	41,160	—	—	—	—	2	2,100	6	43,260
Tempe	62	1,054,500	20	2,250,300	15	2,384,200	27	704,800	124	6,393,600
Tolleson	6	61,470	—	—	—	—	—	—	6	61,470
Unincorporated Maricopa County	544	7,951,105	18	1,561,270	—	—	103	15,504,296	665	25,016,671
Wickenburg	2	100,000	—	—	—	—	2	26,500	4	126,500
Youngtown	18	47,127	1	448,000	—	—	5	23,000	24	518,127

Arizona Building Permits: Monthly Report (Continued)

	RESIDENTIAL*		COMMERCIAL		INDUSTRIAL		OTHER		TOTAL	
	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value	Number of Permits	Dollar Value
MOHAVE COUNTY	249	4,527,014	20	4,070,069	—	—	200	284,386	469	8,881,469
Kingman City	27	1,291,202	4	6,120	—	—	6	4,840	37	1,302,162
Kingman Area	39	362,708	—	—	—	—	34	31,280	73	393,988
Lake Havasu City	46	1,266,725	9	3,505,504	—	—	6	38,350	61	4,810,579
Lake Havasu Area	1	10,976	—	—	—	—	4	6,576	5	17,552
Mohave Valley North	80	986,748	5	506,688	—	—	86	109,218	171	1,602,654
Mohave Valley South	39	457,830	2	51,757	—	—	51	76,254	92	585,841
Dolan Springs	2	23,456	—	—	—	—	1	6,480	3	29,936
Sacramento Valley	15	127,369	—	—	—	—	12	11,388	27	138,757
Mohave County General	—	—	—	—	—	—	—	—	—	—
NAVAJO COUNTY	37	532,209	—	—	—	—	10	20,142	47	552,351
Holbrook	4	10,600	—	—	—	—	1	1,000	5	11,600
Show Low	—	—	—	—	—	—	4	3,650	4	3,650
Snowflake	1	N/C	—	—	—	—	—	—	1	—
Taylor	2	1,800	—	—	—	—	—	—	2	1,800
Unincorporated Navajo County	25	485,309	—	—	—	—	4	14,892	29	500,201
Winslow	5	34,500	—	—	—	—	1	600	6	35,100
PIMA COUNTY	785	16,787,121	35	7,782,460	2	144,000	401	4,089,277	1,223	28,802,858
Marana	3	N/C	1	N/C	—	—	—	—	4	—
Oro Valley	3	25,500	—	—	—	—	—	—	3	25,500
South Tucson	11	65,570	4	2,025	—	—	—	—	15	67,595
Tucson	261	4,915,721	18	4,733,135	1	42,000	186	2,917,717	466	12,608,573
Unincorporated Pima County	507	11,780,330	12	3,047,300	1	102,000	215	1,171,560	735	16,101,190
PINAL COUNTY	99	770,622	6	436,600	—	—	36	537,230	141	1,744,452
Casa Grande	5	138,201	3	241,600	—	—	1	7,150	9	386,951
Coolidge	18	23,706	—	—	—	—	1	450,000	19	473,706
Eloy	1	12,000	1	130,000	—	—	6	8,882	8	150,882
Florence	2	1,900	1	10,000	—	—	4	4,549	7	16,449
Kearny	3	11,500	—	—	—	—	—	—	3	11,500
Mammoth	7	64,000	—	—	—	—	—	—	7	64,000
Superior	—	—	—	—	—	—	1	2,000	1	2,000
Unincorporated Pinal County	63	519,315	1	55,000	—	—	23	64,649	87	638,964
SANTA CRUZ COUNTY	18	872,950	—	—	—	—	5	18,721	23	891,671
Nogales	5	199,862	—	—	—	—	2	6,500	7	206,362
Patagonia	—	—	—	—	—	—	1	50	1	50
Unincorporated Santa Cruz County	13	673,088	—	—	—	—	2	12,171	15	685,259
YAVAPAI COUNTY	181	4,018,948	15	1,161,580	5	12,502,500	58	615,181	259	18,298,209
Chino Valley	11	143,200	—	—	—	—	3	2,000	14	145,200
Clarkdale	2	29,300	—	—	—	—	1	300	3	29,600
Cottonwood	10	55,510	3	130,000	—	—	4	79,620	17	265,130
Jerome	1	400	1	1,200	—	—	—	—	2	1,600
Prescott	34	741,062	5	612,150	—	—	32	78,585	71	1,431,797
Unincorporated Yavapai County	108	2,742,616	5	363,700	5	12,502,500	17	424,676	135	16,033,492
Prescott Valley	15	306,860	1	54,530	—	—	1	30,000	17	391,390
YUMA COUNTY	159	2,753,836	8	507,609	1	23,475	34	559,765	202	3,844,685
Parker	13	480,300	—	—	—	—	6	86,400	19	566,700
Somerton	4	117,300	—	—	—	—	—	—	4	117,300
Unincorporated Yuma County	124	1,706,988	6	256,635	—	—	17	338,677	147	2,302,300
Wellton	—	—	—	—	—	—	—	—	—	—
Yuma	18	449,248	2	250,974	1	23,475	11	134,688	32	858,385
TOTAL Maricopa County, December, 1980	1,862	47,257,583	113	33,711,903	37	9,760,052	1,523	32,743,141	3,535	123,472,679
TOTAL Maricopa County, December, 1979	1673	33,248,577	115	60,955,163	26	13,362,979	1,390	10,343,631	3,204	117,910,350
PERCENT CHANGE	11	42	-2	-45	42	-27	10	217	10	5
TOTAL Arizona, December, 1980	3,645	83,591,448	217	51,896,642	49	22,668,481	2,408	40,179,094	6,319	198,335,665
TOTAL Arizona, December, 1979	3,810	67,147,006	204	77,828,332	29	13,554,942	2,009	17,105,577	6,052	175,635,857
PERCENT CHANGE	-4	24	6	-33	69	67	20	135	4	13

*Includes mobile homes. N/R: No report. N/C: Not collected

Arizona New Housing Starts: Monthly Report

DECEMBER, 1980

	BUILDING PERMITS ISSUED				
	1* Family	Duplex	3-4 Families	5 or More	Housing Units
APACHE COUNTY	4	—	—	—	4
Eagar	—	—	—	—	—
St. Johns	1	—	—	—	1
Springerville	1	—	—	—	1
Uninc. Apache Co.	2	—	—	—	2
COCHISE COUNTY	59	—	—	—	59
Benson	8	—	—	—	8
Bisbee	—	—	—	—	—
Douglas	6	—	—	—	6
Huachuca City	1	—	—	—	1
Sierra Vista	14	—	—	—	14
Tombstone	—	—	—	—	—
Uninc. Cochise Co.	26	—	—	—	26
Willcox	4	—	—	—	4
COCONINO COUNTY	65	1	2	3	156
Flagstaff	26	1	2	2	45
Fredonia	—	—	—	—	—
Page	3	—	—	—	3
Uninc. Coconino Co.	35	—	—	1	107
Williams	1	—	—	—	1
GILA COUNTY	20	—	—	—	20
Globe	1	—	—	—	1
Hayden	—	—	—	—	—
Miami	—	—	—	—	—
Payson	4	—	—	—	4
Uninc. Gila Co.	15	—	—	—	15
GRAHAM COUNTY	24	—	—	—	24
Pima	—	—	—	—	—
Safford	5	—	—	—	5
Thatcher	—	—	—	—	—
Uninc. Graham Co.	19	—	—	—	19
GREENLEE COUNTY	—	—	—	—	—
Clifton	—	—	—	—	—
Duncan	—	—	—	—	—
Uninc. Greenlee Co.	—	—	—	—	—
MARICOPA COUNTY	1,186	15	18	16	1,916
Avondale	5	—	—	—	5
Buckeye	1	—	—	—	1
Chandler	272	—	3	—	281
El Mirage	1	—	—	—	1
Gila Bend	—	—	—	—	—
Gilbert	2	—	1	—	6
Glendale	66	—	—	—	66
Goodyear	—	—	—	—	—
Guadalupe	—	—	—	—	—
Mesa	84	8	4	1	132
Paradise Valley	10	—	—	—	10
Peoria	29	—	—	—	29
Phoenix	245	5	6	5	781
Scottsdale	91	2	—	4	127
Surprise	3	—	—	—	3
Tempe	20	—	3	6	113
Tolleson	2	—	—	—	2
Uninc. Maricopa Co.	353	—	1	—	357
Wickenburg	2	—	—	—	2
Youngtown	—	—	—	—	—

	BUILDING PERMITS ISSUED				
	1* Family	Duplex	3-4 Families	5 or More	Housing Units
MOHAVE COUNTY	156	—	—	8	222
Kingman City	19	—	—	—	19
Kingman Area	26	—	—	—	26
Lake Havasu City	33	—	—	6	89
Lake Havasu Area	1	—	—	—	1
Mohave Valley North	44	—	—	2	54
Mohave Valley South	23	—	—	—	23
Dolan Springs	1	—	—	—	1
Sacramento Valley	9	—	—	—	9
Mohave Co. General	—	—	—	—	—
NAVAJO COUNTY	26	—	—	—	26
Holbrook	—	—	—	—	—
Show Low	—	—	—	—	—
Snowflake	1	—	—	—	1
Taylor	1	—	—	—	1
Uninc. Navajo Co.	21	—	—	—	21
Winslow	3	—	—	—	3
PIMA COUNTY	513	3	8	4	643
Marana	2	—	—	—	2
Oro Valley	—	—	—	—	—
South Tucson	2	—	—	—	2
Tucson	160	3	8	3	274
Uninc. Pima Co.	349	—	—	1	365
PINAL COUNTY	44	2	3	—	60
Casa Grande	1	—	2	—	9
Coolidge	—	1	—	—	2
Eloy	1	—	—	—	1
Florence	—	—	—	—	—
Kearny	—	—	—	—	—
Mammoth	5	—	—	—	5
Superior	—	—	—	—	—
Uninc. Pinal Co.	37	1	1	—	43
SANTA CRUZ COUNTY	15	1	—	—	17
Nogales	4	—	—	—	4
Patagonia	—	—	—	—	—
Uninc. Santa Cruz Co.	11	1	—	—	13
YAVAPAI COUNTY	118	—	7	—	144
Chino Valley	4	—	—	—	4
Clarkdale	2	—	—	—	2
Cottonwood	3	—	2	—	9
Jerome	—	—	—	—	—
Prescott	11	—	3	—	23
Uninc. Yavapai Co.	87	—	1	—	91
Prescott Valley	11	—	1	—	15
YUMA COUNTY	100	—	1	1	110
Parker	12	—	—	—	12
Somerton	3	—	—	—	3
Uninc. Yuma Co.	76	—	—	1	82
Wellton	—	—	—	—	—
Yuma	9	—	1	—	13
TOTAL, Maricopa Co. December, 1980	1,186	15	18	16	1,916
TOTAL, Maricopa Co. December, 1979	987	6	7	14	1,932
PERCENT CHANGE	20.	150.	157.	14.	-1.
TOTAL, Arizona, December, 1980	2,330	22	39	32	3,401
TOTAL, Arizona, December, 1979	2,193	18	18	23	3,387
PERCENT CHANGE	6.	22.	117.	39.	0.

* Includes mobile homes. N/R: No Report. N/C: Not collected.

Retail Food Prices

JANUARY, 1981

Retail food prices in Maricopa County rose 1.2 percent in January, following a 1.4 percent gain in December. The food price survey is compiled by the Bureau of Business and Economic Research, College of Business Administration, at Arizona State University. Cosponsor of the study is Valley National Bank. The January index of 258.7 indicates that shoppers would now have to pay $25.87 for a similar basket of foods that would have cost $10.00 in 1967. These foods could have been purchased for $23.17 one year ago. The January, 1981 index reflects an 11.7 percent increase over the January, 1980 value.

The increase in this month's index was due to a gain in all but one of the subgroups. *Fruits and Vegetables* rose 2.7 percent, followed by *Cereals and Bakery Products* (2.4 percent), *Other Foods* (2.3 percent), and *Dairy Products* (0.5 percent). These gains were partially offset by a slight drop in *Meats, Poultry, Fish, and Eggs* (-0.8 percent).

Soaring prices for tomatoes (up 30.4 percent) and potatoes (22.3 percent) contributed to the overall gain in *Fruits and Vegetables*. Increases were also posted for apples (2.8 percent) and lettuce (2.6 percent). Partially counteracting these gains were falling prices for oranges (-21.4 percent) and bananas (-8.5 percent).

Prices were up this month in almost all categories of *Cereals and Bakery Products*. Largest increases were noted for fresh cake and cupcakes (6.2 percent, followed by flour and prepared flour mixes (5.1 percent). Climbing prices for rice pushed the category of rice, macaroni, and cornmeal up 3.7 percent, while cereal rose 3.4 percent.

Carbonated drinks (excluding nondietary cola) advanced 9.3 percent in January, contributing to the gain in *Other Foods*. The cost of sugar and artificial sweeteners is still on the upswing, increasing 6.0 percent. Also rising were prices for nuts, potato chips, and other snacks (4.5 percent). Roasted coffee prices, down 1.2 percent, fell for the fourth consecutive month.

Prices for most items in the *Dairy Products* subgroup rose slightly or were unchanged this month, resulting in a small overall gain. Ice cream and related products increased 2.3 percent, followed by a 1.0 percent rise in fresh milk (other than whole milk) and cream.

The drop in *Meats, Poultry, Fish, and Eggs* was this subgroup's first decline since May, 1980, and was the result of lower prices in several categories. Most notable were price reductions for eggs (-6.7 percent), fresh whole chicken (-6.2 percent), noncanned ham (-6.0 percent), and pork chops (-4.0 percent). Partially offsetting these decreases were higher prices for lunchmeats other than bologna, liverwurst, and salami (8.8 percent), followed by sausage and bacon.

A comparison of October, 1980 Food Consumed at Home for Maricopa County with index values for four selected metropolitan areas reveals that the outlays required to purchase a foodstuffs group in October, 1980 (obtainable for an outlay of $10.00 at 1967 average prices) were $25.02 in Maricopa County; $25.80 in Los Angeles-Long Beach; $26.20 in San Francisco-Oakland; $26.20 in Chicago-Northwestern Indiana; and averaged $26.00 in the United States.

TABLE 1
INDEX FOR FOOD CONSUMED AT HOME
Maricopa County, United States, and Selected Metropolitan Areas
(Average 1967 = 100 percent)

Group	Maricopa County Jan '81[a]	Maricopa County Oct '80[b]	United* States Oct '80	Los Angeles* Long Beach Oct '80	San Francisco Oakland Oct '80	Chicago* Northwestern Indiana Oct '80
Food Consumed at Home	258.7	250.2	260.0	258.0	262.0	262.0
Cereals and Bakery Products	243.5	234.6	253.7	266.7	259.4	258.9
Meats, Poultry, Fish, and Eggs	262.4	258.3	252.6	250.6	259.8	259.3
Dairy Products	226.7	217.1	232.7	227.9	229.3	226.6
Fruits and Vegetables	243.3	236.6	254.2	243.9	247.7	254.4
Other Foods Consumed at Home	290.2	276.8	312.2	305.4	319.4	317.5

* Computed from data contained in *The Consumer Price Index*, U.S. Department of Labor, Bureau of Labor Statistics, Washington, D.C.

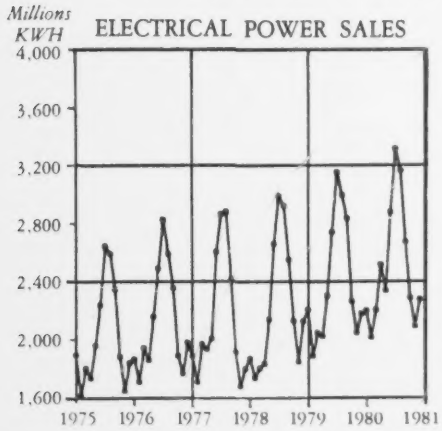
[a]Maricopa County food prices are reported for the month closest to publication.

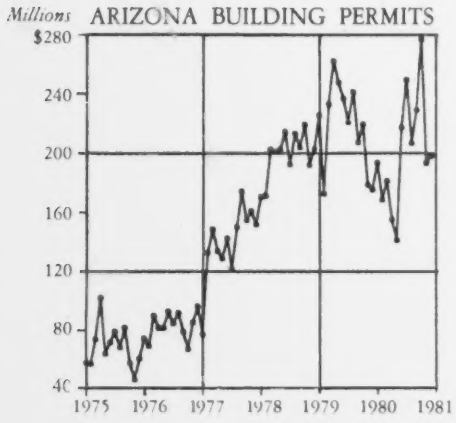
[b]Comparisions of food prices among various cities and the United States average are made on the basis of earlier months because of the lag in collecting price reports from these other areas.

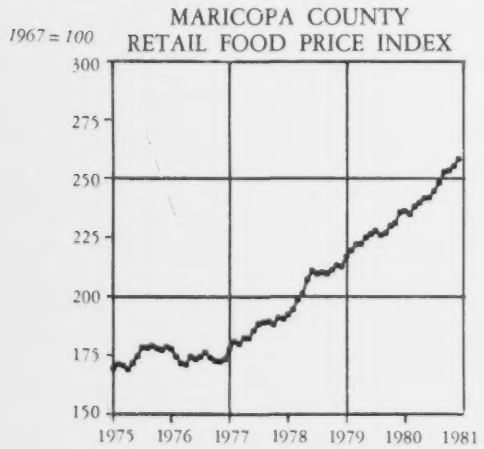
Note: Index Comparisons between Maricopa County and the other regions show only that food prices in Maricopa County have increased more or less than food prices in the other regions since 1967. The indices cannot be used to determine the actual differences in food price levels between the regions.

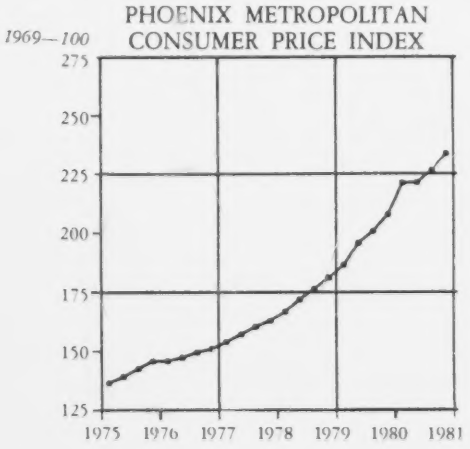
Sources: Bureau of Business and Economic Research, College of Business Administration, Arizona State University, in cooperative cosponsorship with Valley National Bank.

Arizona Economic Indicators









Source: All data compiled by the Bureau of Business and Economic Research, College of Business Administration, Arizona State University.